PORTER® PRECISION METRIC

PORTER PRECISION PRODUCTS CO.

PORTER®

PRECISION PRODUCTS INDEX

HEAD TYPE PUNCHES

BAL-LOK AND HEADLESS PUNCHES

PERFORATORS, HOLDERS, AND SUPPORT SLEEVES

DIE BUTTONS

RETAINERS

ADDITIONAL ITEMS AND INFORMATION

STANDARD CATALOG ITEMS (Up to 32 mm Ø Body)

NUMBER OF WORK DAYS TO SHIPMENT

Description	1-19 Pieces	20-50 Pieces
Blanks, Steel Springs, Urethane	1	1
Round Punches (Circular Point)	2	5
Round Dies (Circular ID)	2	5
Shape Punches (flatted round, oblong, square, rectangle)	4	7
Shape Dies (flatted round, oblong, square, rectangle)	4	7
'Z' Shapes - (01 - 16) Page 36 & 37	6	9
'Z' Shapes - (All Others) Page 36 & 37	8	11
Pilots	3	5
Knob Style Punches - Pages 28 & 32	8	12
Guide Bushings - Page 21	3	10
Durable Line - Pages 24 & 25	Quote	Quote
'EX' Shapes, Pages 38 – 40	5	7
Xtreme Punch - Pages 8 – 11	3	10
Center Dowel - Pages 12 & 13	3	10
Specials	Quote	Quote
Coatings - Page 46	Add 5 Days	Add 5 Days
Locating Methods - Pages 44 & 45	Add 0 Days	Add 1 Day
Standard Alterations - Page 42		
Group (1) Below - up to 2 alterations	Add 0 Days	Add 0 Days
Group (2) Below - each alteration	Add 1 Day	Add 2 Days
Group (1) - RL/RT/RH/LPC/LPW/RP/RW/AP/AW & (AB/IB - for Taper Relief Die Matrix)		
Group (2) - PRL/RD/PRT/AR/SK & (AB/IB - for Stepped Relief Die Matrix)		

Allow Additional Time for Multiple Line Item Orders Over 150 Total Pieces Round, or 50 Total Pieces Shape - or Combinations Thereof - Call For Quote

NOTE: THE DAY OF RECEIPT OF THE ORDER IS NOT CONSIDERED A WORK DAY

WILL SHIP TODAY

ORDER MUST BE ENTERED BY NOON E.S.T. - and confirmed by phone

Up to Ø 25 mm body

M2 steel only;

Catalog Rounds - up to 9 pieces with maximum of one alteration

Catalog Shapes - (flat round, oblong, square and rect.) up to 4 pieces/1 alteration

Locking Methods - single and double flats

Items not available for this service

- Knob Style Punches
- Coatings/Treatments
- Dowel Slots/Full Length Body Flats
- Durable Line (catalog pages 24 & 25)
- Extrusion Line
- Pilot Punches over 92 mm "L"

Advise Shipping Method - if not specified will ship FedX or UPS next day delivery

- A.M. or Saturday delivery if available

Additional Cost -

- Round items - add 100% to list price (no minimum charge)
- Shape items - add 50% to list price (no minimum charge)

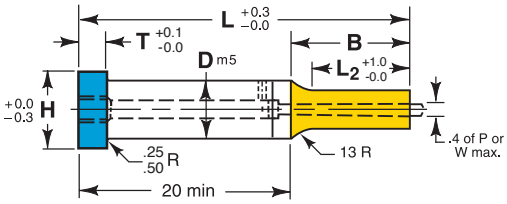
WILL SHIP TOMORROW

ORDER MUST BE ENTERED BY NOON E.S.T. - and confirmed by phone

- Same limitations as "Will Ship Today", PLUS
- Up to 19 piece quantities
- Up to three alterations
- All locking methods available

Additional Cost - add 25% per line item (no minimum charge)

Standard Headed Retrakto Punches (R-)



Ordering Example:

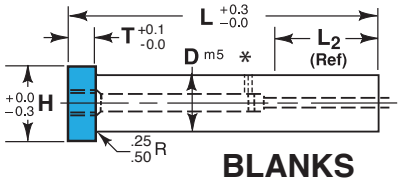
Qty	Steel	Type	Code	L_2/L	P
13	M2	RC	013	19/060	P=10.50

Steel: D2, Rc 58-61, M2, Rc 60-63, PM4 RC 63-65
Heads Rc 40-55 25mm Ø and smaller and L > 50

TOLERANCES

Round P +0.01 -0.00	◎	0.01	P to D
Shape P, W ±0.01	◎	0.02	P,W to D

Back Draft 0.1/100mm L_2 max.

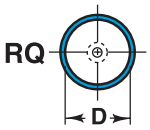


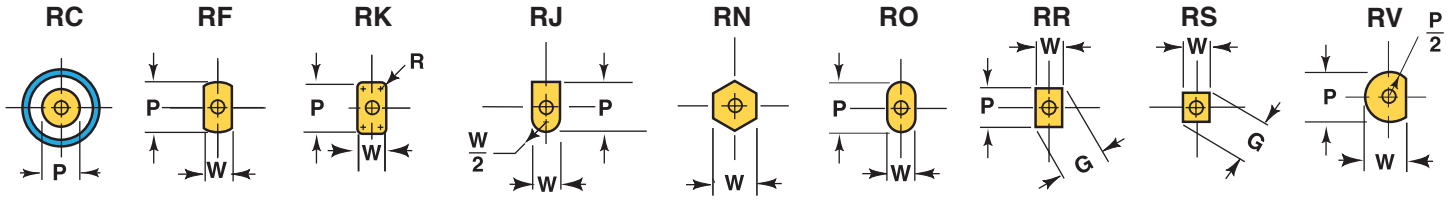
BLANKS

* Side hole location indicated on request

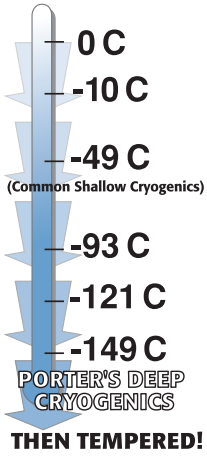
Ordering Example:

Qty	Steel	Type	Code	L_2/L
13	M2	RQ	010	19/080





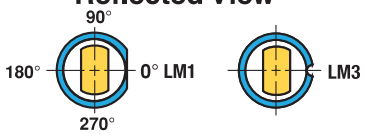
For additional standard forms and configurations see pages 36 - 39.



All Standard Punches up to 25mm Dia. are "Deep Cryogenically" treated for
1. Wear
2. Toughness
3. Dimensional Stability

See page 47 for more details.

Reflected View



Optional **L**ocating **M**ethods See Page 44 & 45 for details and options.

Shank D mm	Shank Code No.	Head H	Head T	L_2 Std.	L_2 Alt.	Lengths L 045	050	056	060	063	070	071	080	090	100	110	120	125	Point Round Range P	Point Shape MinW	Point Shape Max P/G	Replacement Ejector Kit*
5	005	8	5	13	19	◆	•	•	•	•	•	•	•						1.60 – 4.99	1.60	5.00	K2M
6	006	9	5	13	19	◆	•	•	•	•	•	•	•	•	•				2.40 – 5.99	2.40	6.00	K3M
8	008	11	5	19	25		◆	•	•	•	•	•	•	•	•				3.20 – 7.99	3.20	8.00	K4M
10	010	13	5	19	25		◆	•	•	•	•	•	•	•	•	•	•		4.50 – 9.99	4.50	10.00	K6M
13	013	16	5	19	25		◆	•	•	•	•	•	•	•	•	•	•		6.00 –12.99	6.00	13.00	K6M
16	016	19	5	19	25		◆	•	•	•	•	•	•	•	•	•	•	•	8.00 –15.99	7.20	16.00	K9M
20	020	23	5	19	25		◆	•	•	•	•	•	•	•	•				10.00 –19.99	8.00	20.00	K9M
25	025	28	5	19	25		◆	•	•	•	•	•	•	•	•				12.00 –24.99	9.00	25.00	K9M
32	032	35	5	25	30					•	•	•	•	•	•				16.00 –31.99	10.00	32.00	K12M
40	040	43	5	25	30					•	•	•	•	•	•				20.00 –39.99	10.00	40.00	K12M
45	045	48	5	25	30					•	•	•	•	•	•				25.00 –44.99	10.00	45.00	K12M
50	050	53	5	25	30					•	•	•	•	•	•				30.00 –49.99	10.00	50.00	K12M

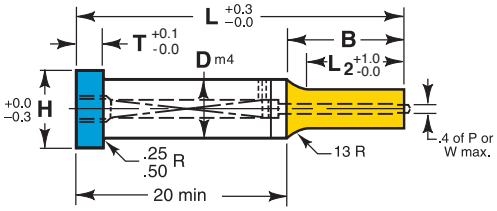
◆ Only available in Standard Point Length.
◆ • Also available in D2 & PM4

*Ejector Kits available see page 41 for details
5 mm Ø + 32 mm Ø + larger = no side hole.

All Lengths in Light Blue Panel have Hot Forged Heads for added strength and toughness.

Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. See page 42.

Ultra Precision Headed Retrakto Punch (PR-)



Steel: D2 Rc 58-61, M2 Rc 60-63, PM4, Rc 63-65

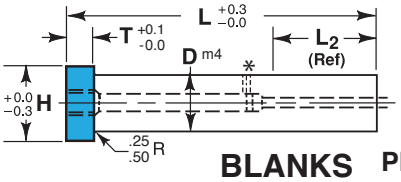
Heads Rc 40-55 (25mm Ø and smaller and L > 50)

TOLERANCES

Round P +0.005 -0.000	◎	.008	P,W to D
Shape P,W +0.005 -0.000	◎	.008	P,W to D

Ordering Example:

Qty	Steel	Type	Code	L_2/L	P
13	M2	PRC	013	19/60	P=10.50

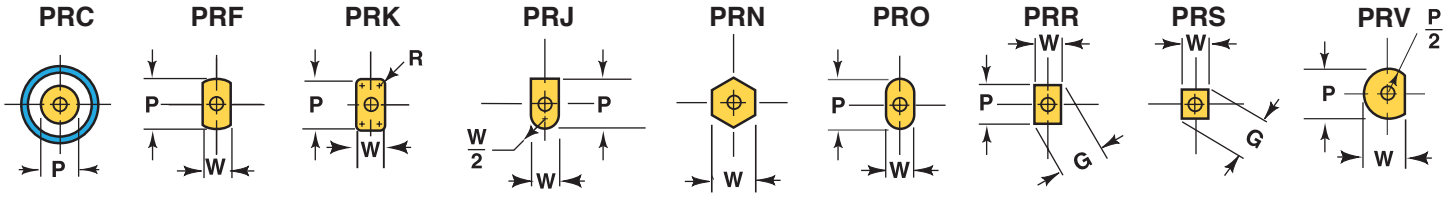


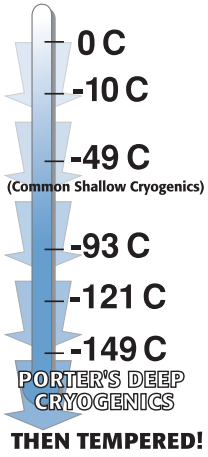
BLANKS

* Side hole location indicated on request

Ordering Example:

Qty	Steel	Type	Code	L_2/L
13	M2	PRQ	010	19/80



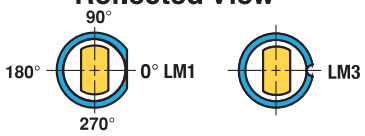


All Ultra Precision Punches up to 25mm Dia. are "Deep Cryogenically" treated for
1. Wear
2. Toughness
3. Dimensional Stability

See page 47 for more details.

For additional standard forms and configurations see pages 36 - 39.

Reflected View



Optional **L**ocating **M**ethods See Page 44 & 45 for details and options.

Shank D mm	Shank Code No.	Head H	Head T	L_2 08	L_2 13	L_2 19	L_2 25	Lengths L 045	050	056	060	063	070	071	080	090	100	110	120	125	Point Range P	Point Min W	Point Max P/G	Replacement Ejector Kit*
5	005	8	5	•	•	•		◆	•	•	•	•	•	•	•						1.60 – 4.99	1.60	5.00	K2M
6	006	9	5	•	•	•	•	◆	•	•	•	•	•	•	•	•	•				2.40 – 5.99	2.40	6.00	K3M
8	008	11	5		•	•	•	◆	•	•	•	•	•	•	•	•	•				3.20 – 7.99	3.20	8.00	K4M
10	010	13	5		•	•	•	◆	•	•	•	•	•	•	•	•	•	•	•		4.50.– 9.99	4.50	10.00	K6M
13	013	16	5		•	•	•		◆	•	•	•	•	•	•	•	•	•	•		6.00 –12.99	6.00	13.00	K6M
16	016	19	5		•	•	•		◆	•	•	•	•	•	•	•	•	•	•	•	8.00 –15.99	7.20	16.00	K9M
20	020	23	5		•	•	•			◆	•	•	•	•	•	•	•				9.50 –19.99	8.00	20.00	K9M
25	025	28	5		•	•	•			◆	•	•	•	•	•	•	•				12.00 –24.99	9.00	25.00	K9M
32	032	35	5										•	•	•	•	•				16.00 –31.99	10.00	32.00	K12M

◆ L_2 = 19 max.

◆ • Also available in D2 & PM4

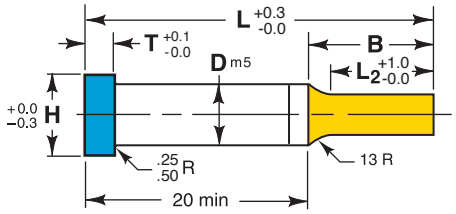
*Ejector Kits available see page 41 for details

5 mm Ø & 32 mm Ø = no side hole.

All Lengths in Light Blue Panel have Hot Forged Heads for added strength and toughness.

Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. See page 42.

Standard Headed Punches (S-)



Ordering Example:

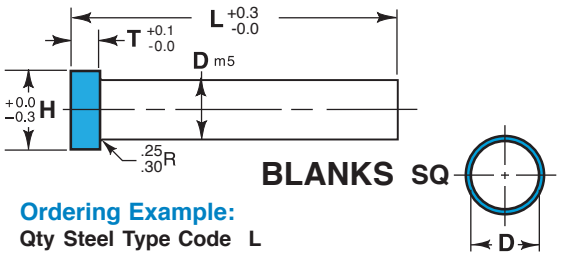
Qty	Steel	Type	Code	L_2/L	P	W	Locate
25	M2	SO	013	25/090	P=12.00	W=6.00	LM2

Steel: D2, Rc 58-61,
M2, Rc 60-63, PM4 RC 63-65
Heads Rc 40-55 25mm Ø and smaller and L > 50

TOLERANCES

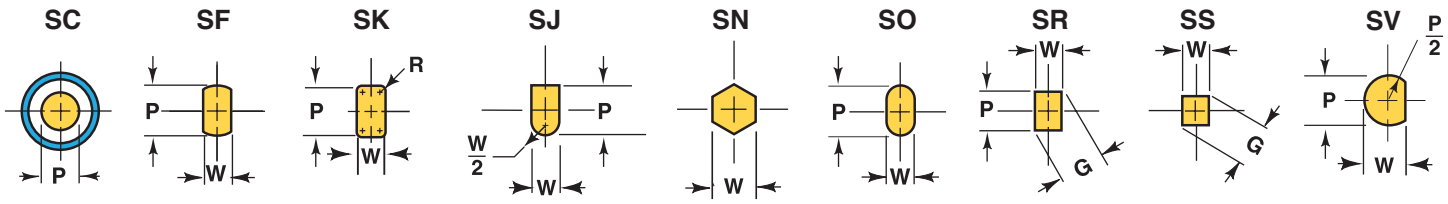
Round P +0.01 -0.00	◎	0.01	P to D
Shape P, W ±0.01	◎	0.02	P,W to D

Back Draft 0.1/100mm L_2 max.

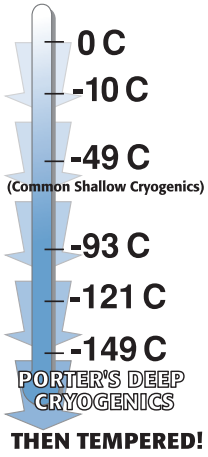


Ordering Example:

Qty	Steel	Type	Code	L
25	M2	SQ	008	056



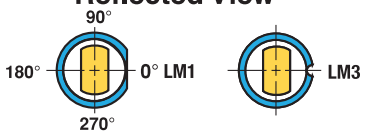
For additional standard forms and configurations see pages 36 - 39.



All Standard Punches up to 25mm Dia. are "Deep Cryogenically" treated for
1. Wear
2. Toughness
3. Dimensional Stability

See page 47 for more details.

Reflected View



Optional **L**ocating **M**ethods See Page 44 & 45 details and options.

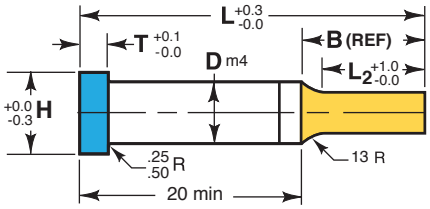
Shank D mm	Shank Code No.	Head H	Head T	L_2 Std.	L_2 Alt.	Lengths L 045	050	056	060	063	070	071	080	090	100	110	125	150	Point Round Range P	Point Shape Min W	Point Shape Max P/G
4	004	7	5	08	13	•	•	•	•	•	•	•	•	•	•				1.60 – 3.99	1.60	4.00
5	005	8	5	13	19	◆	•	•	•	•	•	•	•	•	•				1.60 – 4.99	1.60	5.00
6	006	9	5	13	19	◆	•	•	•	•	•	•	•	•	•				1.60 – 5.99	1.60	6.00
8	008	11	5	19	25		◆	•	•	•	•	•	•	•	•				2.50 – 7.99	2.50	8.00
10	010	13	5	19	25		◆	•	•	•	•	•	•	•	•	•	•	•	3.20 – 9.99	3.20	10.00
13	013	16	5	19	25		◆	•	•	•	•	•	•	•	•	•	•	•	5.00 – 12.99	4.50	13.00
16	016	19	5	19	25		◆	•	•	•	•	•	•	•	•	•	•	•	8.00 – 15.99	6.00	16.00
20	020	23	5	19	25		◆	•	•	•	•	•	•	•	•	•	•	•	10.00 – 19.99	8.00	20.00
22	022	25	5	19	25		◆	•	•	•	•	•	•	•	•	•			11.00 – 21.99	8.50	22.00
25	025	28	5	19	25		◆	•	•	•	•	•	•	•	•	•			12.00 – 24.99	9.00	25.00
32	032	35	5	25	30					•	•	•	•	•	•	•			16.00 – 31.99	10.00	32.00
40	040	43	5	25	30					•	•	•	•	•	•				20.00 – 39.99	10.00	40.00
45	045	48	5	25	30					•	•	•	•	•	•				25.00 – 44.99	10.00	45.00
50	050	53	5	25	30					•	•	•	•	•	•				30.00 – 49.99	10.00	50.00

◆ Only available in Standard Point Length.
◆ • Also available in D2 & PM4

All Lengths in Light Blue Panel have Hot Forged Heads for added strength and toughness.

Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. See page 42.

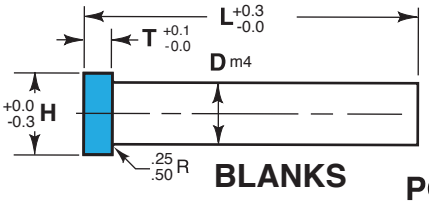
Ultra Precision Headed Punch (P-)



Steel: D2, Rc 58-61, M2 Rc 60-63
PM4, Rc 63-65
Heads Rc 40-55 (25mm Ø and smaller and L > 50)

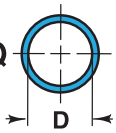
TOLERANCES

Round P +0.005 -0.000	◎ .008	P,W to D
Shape P,W +0.005 -0.000	◎ .008	P,W to D



BLANKS

PQ



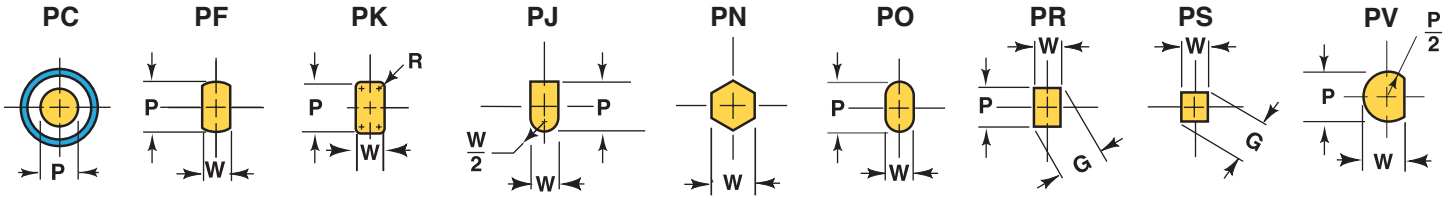
Ordering Example:

Qty	Steel	Type	Code	L_2/L	P	W	Locate
13	PM4	PS	013	19/071	P=5.50	W=5.50	LM2

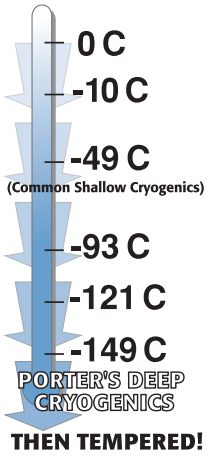
Ordering Example:

Qty	Steel	Type	Code	L
25	PM4	PQ	020	100

PC PF PK PJ PN PO PR PS PV



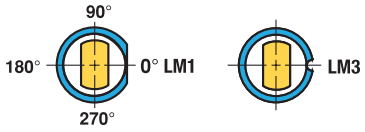
For additional standard forms and configurations see pages 36 - 39.



All Ultra Precision Punches up to 25mm Dia. are "Deep Cryogenically" treated for
1. Wear
2. Toughness
3. Dimensional Stability

See page 47 for more details.

Reflected View



Optional **L**ocating **M**ethods See Page 44 & 45 for details and options.

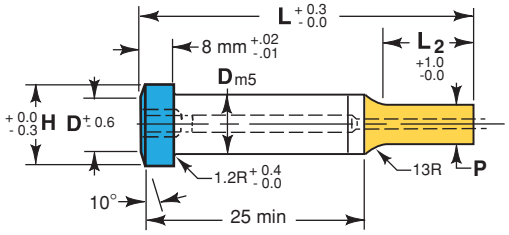
Shank		Head		L_2				Lengths L													Range	Min	Max
D mm	Code No.	H	T	08	13	19	25	045	050	056	060	063	070	071	080	090	100	110	125	150	P	W	P/G
4	004	7	5	•	•	•	•	•	•	•	•	•	•	•	•	•	•				1.00 – 3.99	1.60	4.00
5	005	8	5	•	•	•	•	•	•	•	•	•	•	•	•	•	•				1.20 – 4.99	1.60	5.00
6	006	9	5	•	•	•	•	•	•	•	•	•	•	•	•	•	•				1.60 – 5.99	1.60	6.00
8	008	11	5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		2.50 – 7.99	2.50	8.00
10	010	13	5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	3.20 – 9.99	3.20	10.00
13	013	16	5		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	5.00 –12.99	4.50	13.00
16	016	19	5		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	8.00 –15.99	6.00	16.00
20	020	23	5		•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	9.00 –19.99	8.00	20.00
22	022	25	5		•	•	•		•	•	•	•	•	•	•	•	•	•			10.00 –21.99	8.50	22.00
25	025	28	5		•	•	•		•	•	•	•	•	•	•	•	•	•			12.00 –24.99	9.00	25.00
32	032	35	5		•	•	•				•	•	•	•	•	•	•	•			16.00 –31.99	10.00	32.00

(P,W below 1.60 L2 = 8 max.) P,W below 2.50 L2 = 19 max.

• Also available in D2 & PM4

All Lengths in Light Blue Panel have Hot Forged Heads for added strength and toughness.

Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. See page 42.



Ordering Example:

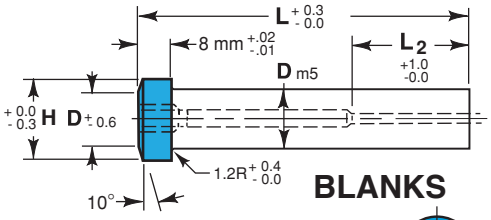
Qty	Type Code	L_2/L	P
8	XRC	013	13/080 P=6.90

Steel:
M2, Rc 60-63, PM4 Rc 60-63

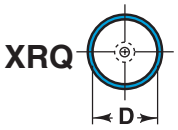
TOLERANCES

Round P +0.01 -0.00	◎	0.01	P to D
Shape P, W ±0.01	◎	0.02	P,W to D

Back Draft 0.1/100mm L_2 max.

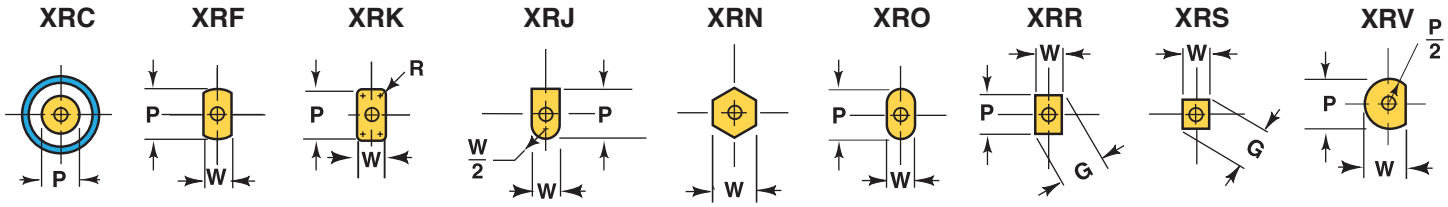


BLANKS

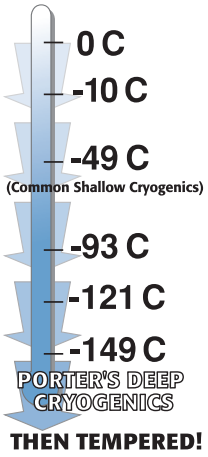


Ordering Example:

Qty	Type Code	L_2/L
8	XRQ	013 13/080



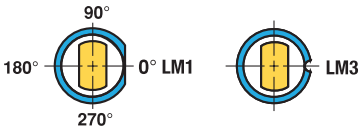
For additional standard forms and configurations see pages 36 - 39.



All Porter Extreme Punches are "Deep Cryogenically" treated for
1. Wear
2. Toughness
3. Dimensional Stability

See page 47 for more details.

Reflected View

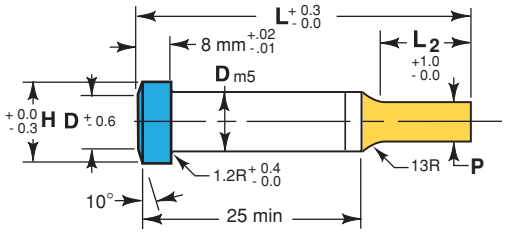


Optional **L**ocating **M**ethods See Page 44 & 45 for details and options.

Shank D mm	Shank Code No.	Head H mm	Point Length L2 Std	Point Length L2 Alt	Lengths L 060	070	080	090	100	Round Point Range P	Shapes Min W	Shapes Max P/G	Replacement Ejector Kit*
8	008	13	13	19	●	●	●	●	●	4.00 - 7.99	4.00	8.00	K4M
10	010	15	13	19	●	●	●	●	●	5.00 - 9.99	5.00	10.00	K6M
13	013	18	13	19	●	●	●	●	●	6.00 - 12.99	6.00	13.00	K6M
16	016	21	19	25	●	●	●	●	●	10.00 - 15.99	6.00	16.00	K9M
20	020	25	19	25	●	●	●	●	●	13.00 - 19.99	6.00	20.00	K9M
25	025	30	19	25	●	●	●	●	●	18.00 -24.99	6.00	25.00	K9M

*Ejector Kits available see page 41 for details

Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. See page 42.



Ordering Example:

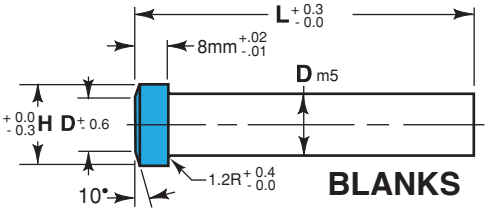
Qty	Type	Code	L_2/L	P	W
12	XSO	020	19/090	P=15.00	W=8.50

Steel:
M2, Rc 60-63, PM4 RC 60-63

TOLERANCES

Round P +0.01 -0.00	◎	0.01	P to D
Shape P, W ±.0.01	◎	0.02	P,W to D

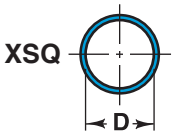
Back Draft 0.1/100mm L_2 max.

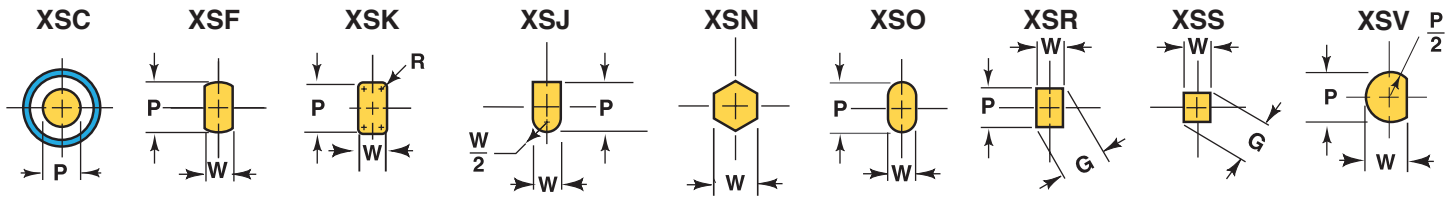


BLANKS

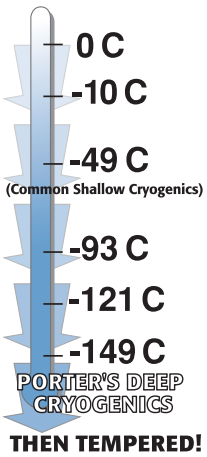
Ordering Example:

Qty	Steel	Type	Code	L
25	M2	XSQ	008	060





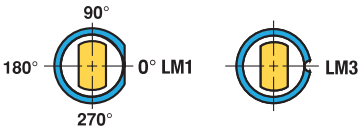
For additional standard forms and configurations see pages 36 - 39.



All Porter Extreme Punches are "Deep Cryogenically" treated for
1. Wear
2. Toughness
3. Dimensional Stability

See page 47 for more details.

Reflected View

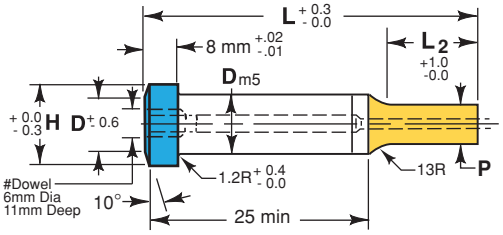


Optional **L**ocating **M**ethods See Page 44 & 45 for details and options.

Shank D mm	Shank Code No.	Head H mm	Point Length L_2 Std	Point Length L_2 Alt	Lengths L 060	070	080	090	100	Round Point Range P	Shapes Min. W	Shapes Max P/G
8	008	13	13	19	●	●	●	●	●	3.00 – 7.99	3.00	8.00
10	010	15	13	19	●	●	●	●	●	3.00 – 9.99	3.00	10.00
13	013	18	13	19	●	●	●	●	●	6.00 – 12.99	3.00	13.00
16	016	21	19	25	●	●	●	●	●	10.00 – 15.99	4.00	16.00
20	020	25	19	25	●	●	●	●	●	13.00 – 19.99	5.00	20.00
25	025	30	19	25	●	●	●	●	●	18.00 – 24.99	6.00	25.00

Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. See page 42.

Xtreme Center Dowel Retrakto Punches (CDXR-)



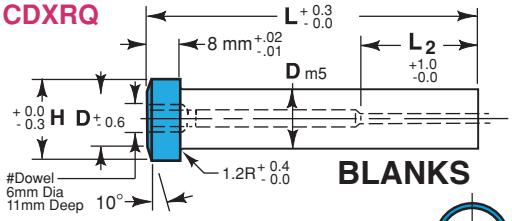
Steel: PM4 Rc 60-63
Heads Rc 40-55

TOLERANCES

Round P +0.01 -0.00	◎	0.01	P to D
Shape P, W ±0.01	◎	0.02	P,W to D

Back Draft 0.1/100mm L_2 max.

CDXRQ



BLANKS

Ordering Example:

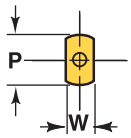
Qty	Type	Code	L_2/L	P
8	CDXRC	013	13/080	P=6.90

Ordering Example:

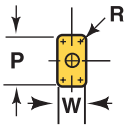
Qty	Type	Code	L_2/L
13	CDXRQ	010	19/080

CDXRC

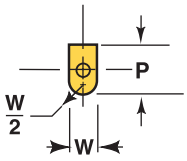
CDXRF



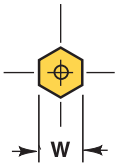
CDXRK



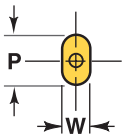
CDXRJ



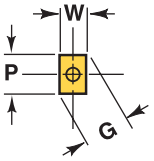
CDXRN



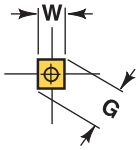
CDXRO



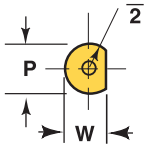
CDXRR



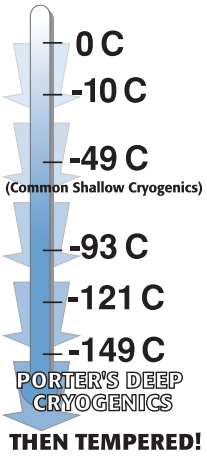
CDXRS



CDXRV



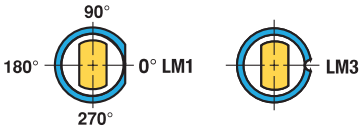
For additional standard forms and configurations see pages 36 - 39.



All Porter Extreme Punches are "Deep Cryogenically" treated for
1. Wear
2. Toughness
3. Dimensional Stability

See page 47 for more details.

Reflected View



Optional **L**ocating **M**ethods See Page 44 & 45 for details and options.

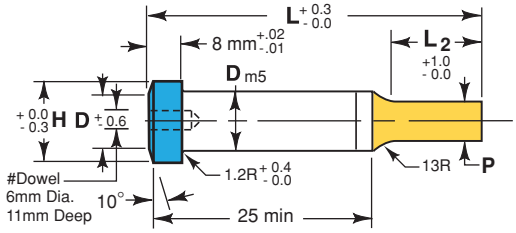
Shank D mm	Shank Code No.	Head H mm	Point Length L_2 Std	Point Length L_2 Alt	Lengths L 080	Lengths L 090	Lengths L 100	Round Point Range P	Shapes Min W	Shapes Max P/G	Replacement Ejector Kit*
10	010	15	13	19	●	●	●	5.00 - 9.99	5.00	10.00	K6M
13	013	18	13	19	●	●	●	6.00 - 12.99	6.00	13.00	K6M
16	016	21	19	25	●	●	●	10.00 - 15.99	6.00	16.00	K9M
20	020	25	19	25	●	●	●	13.00 - 19.99	6.00	20.00	K9M
25	025	30	19	25	●	●	●	18.00 -24.99	6.00	25.00	K9M

*Ejector Kits available see page 41 for details.

#Standard dowel supplied. Pull dowel available upon request.

Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. See page 42.

Xtreme Center Dowel Punches (CDXS-)



Steel: PM4 Rc 60-63
Heads Rc 40-55

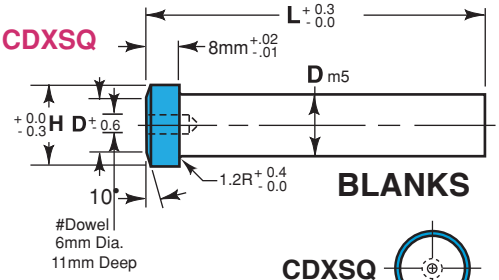
TOLERANCES

Round P +0.01 -0.00	◎	0.01	P to D
Shape P, W ±0.01	◎	0.02	P,W to D

Back Draft 0.1/100mm L_2 max.

Ordering Example:

Qty	Type	Code	L_2/L	P	W
12	CDXSO	020	19/080	P=15.00	W=8.50

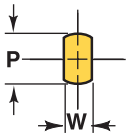


Ordering Example:

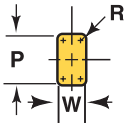
Qty	Type	Code	L
13	CDXSQ	010	19/080

CDXSC

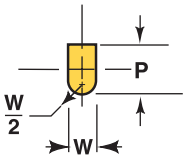
CDXSF



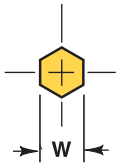
CDXSK



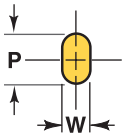
CDXSJ



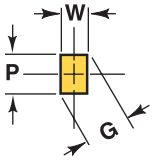
CDXSN



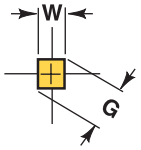
CDXSO



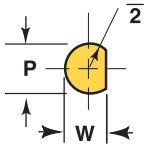
CDXSR



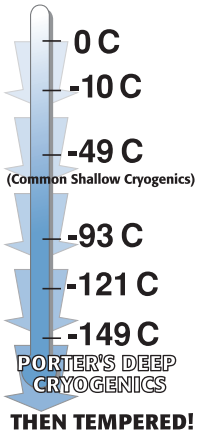
CDXSS



CDXSV



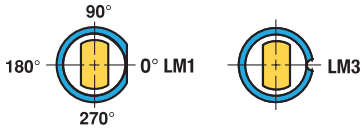
For additional standard forms and configurations see pages 36 - 39.



All Xtreme Punches are "Deep Cryogenically" treated for
1. Wear
2. Toughness
3. Dimensional Stability

See page 47 for more details.

Reflected View



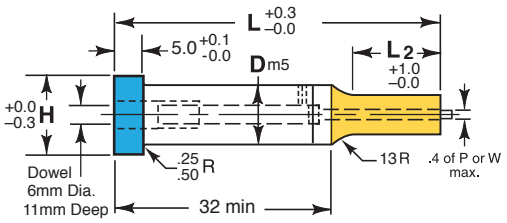
Optional **L**ocating **M**ethods See Page 44 & 45 for details and options.

Shank D mm	Shank Code No.	Head H mm	Point Length L_2 Std	Point Length L_2 Alt	Lengths L 80	Lengths L 90	Lengths L 100	Round Point Range P	Shapes Min. W	Shapes Max P/G
10	010	15	13	19	●	●	●	3.00 – 9.99	3.00	10.00
13	013	18	13	19	●	●	●	6.00 –12.99	3.00	13.00
16	016	21	19	25	●	●	●	10.00 –15.99	4.00	16.00
20	020	25	19	25	●	●	●	13.00 –19.99	5.00	20.00
25	025	30	19	25	●	●	●	18.00 –24.99	6.00	25.00

#Standard dowel supplied. Pull dowel available upon request

Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. See page 42.

Standard Center Dowel Retrakto Punches (CDR-)

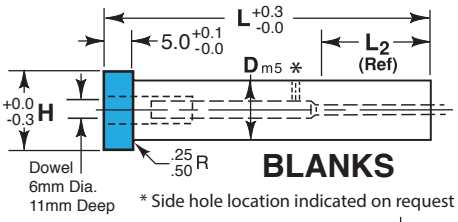


Steel: M2 Rc 60-63
Heads Rc 40-55 (25 mm Ø and smaller)

TOLERANCES

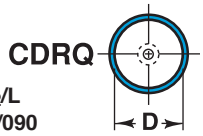
Round P +0.01 -0.00	◎	0.01	P to D
Shape P, W ±0.01	◎	0.02	P,W to D

Back Draft 0.1/100mm L_2 max.



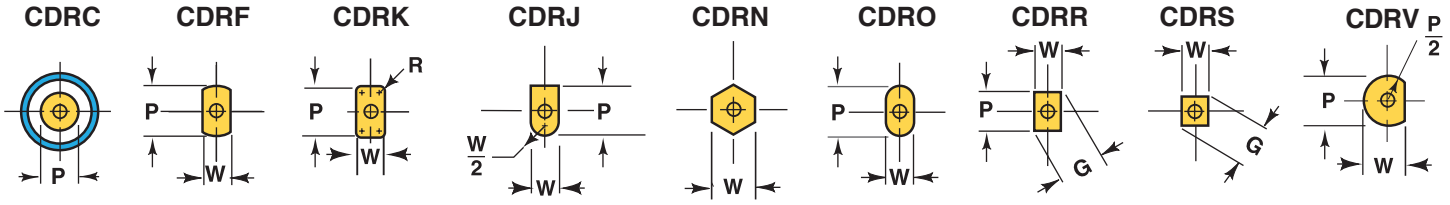
Ordering Example:

Qty	Steel	Type	Code	L_2/L	P	W
25	M2	CDRO	010	25/090	P=8.50	W=5.00

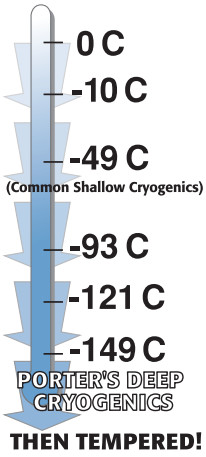


Ordering Example:

Qty	Steel	Type	Code	L_2/L
25	M2	CDRQ	025	19/090



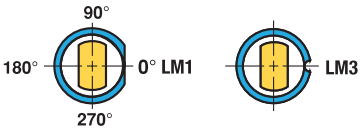
For additional standard forms and configurations see pages 36 - 39.



All Standard Center Dowel Punches "Deep Cryogenically" treated for
1. Wear
2. Toughness
3. Dimensional Stability

See page 47 for more details.

Reflected View



Optional **L**ocating **M**ethods See Page 44 & 45 for details and options.

Shank D mm	Shank Code No.	Head H mm	Point Length L_2 Std	Point Length L_2 Alt	Lengths L 071	080	090	100	Round Point Range P	Shapes Min W	Shapes Max P/G	Replacement Ejector Kit*
10	010	13	19	25	●	●	●	●	4.50 - 9.99	4.50	10.00	K6M
13	013	16	19	25	●	●	●	●	6.00 - 12.99	6.00	13.00	K6M
16	016	19	19	25	●	●	●	●	8.00 - 15.99	7.20	16.00	K9M
20	020	23	19	25	●	●	●	●	10.00 - 19.99	8.00	20.00	K9M
25	025	28	19	25	●	●	●	●	12.00 - 24.99	9.00	25.00	K9M
32	032	35	25	30	●	●	●	●	16.00 - 31.99	10.00	32.00	K9M

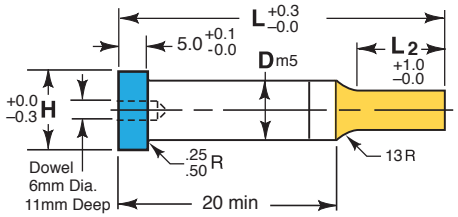
*Ejector Kits available see Page 41 for details.

32 mm Ø = no side hole.

All Lengths in Light Blue Panel have Hot Forged Heads for added strength and toughness.

Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. See page 42.

Standard Center Dowel Punches (CDS-)



Steel: M2 Rc 60-63
Heads Rc 40-55 (25 mm Ø and smaller)

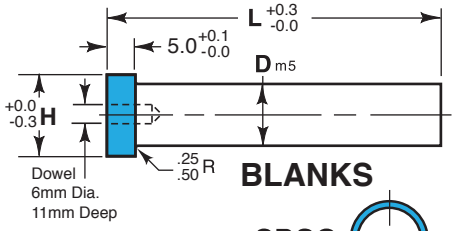
TOLERANCES

Round P +0.01 -0.00	◎	0.01	P to D
Shape P, W ±0.01	◎	0.02	P,W to D

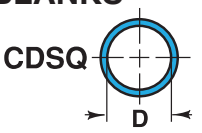
Back Draft 0.1/100mm L_2 max.

Ordering Example:

Qty	Steel	Type	Code	L_2/L	P
50	M2	CDSC	016	19/090	P=10.00



BLANKS

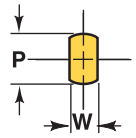


Ordering Example:

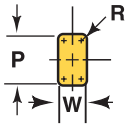
Qty	Steel	Type	Code	L
12	M2	CDSQ	032	100

CDSC

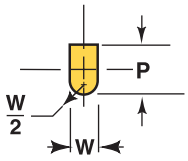
CDSF



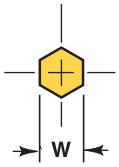
CDSK



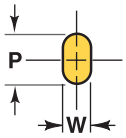
CDSJ



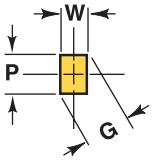
CDSN



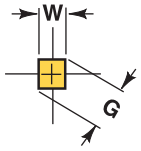
CDSO



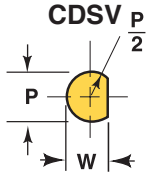
CDSR



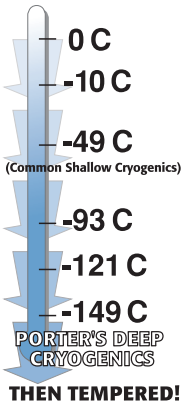
CDSS



CDSV



For additional standard forms and configurations see pages 36 - 39.

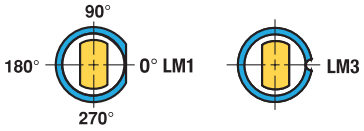


All Standard Center Dowel Punches up to 25mm Dia. are "Deep Cryogenically" treated for

1. Wear
2. Toughness
3. Dimensional Stability

See page 47 for more details.

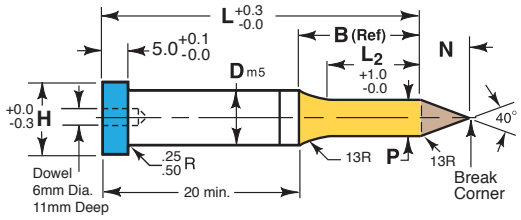
Reflected View



Optional **L**ocating **M**ethods See Page 44 & 45 for details and options.

Shank D mm	Shank Code No.	Head H mm	Point Length L_2 Std	Point Length L_2 Alt	Lengths L 071	080	090	100	110	125	130	140	150	Round Point Range P	Shapes Min W	Shapes Max P/G
10	010	13	19	25	●	●	●	●	●	●	●			4.50 - 9.99	4.50	10.00
13	013	16	19	25	●	●	●	●	●	●	●	●	●	6.00 - 12.99	6.00	13.00
16	016	19	19	25	●	●	●	●	●	●	●	●	●	8.00 - 15.99	7.20	16.00
20	020	23	19	25	●	●	●	●	●	●	●	●	●	10.00 - 19.99	8.00	20.00
25	025	28	19	25	●	●	●	●	●	●	●	●	●	12.00 - 24.99	9.00	25.00
32	032	35	25	30	●	●	●	●	●					16.00 - 31.99	10.00	32.00
38	038	41	25	30	●	●	●	●						16.00 - 37.99	10.00	38.00

Standard Center Dowel Pilot Punches (CDSAP)



B & L Lengths do not include Pilot Tip N

Ordering Example:

Qty	Steel	Type	Code	L2/L	P
25	M2	CDSAP	013	21/065	P=12.00

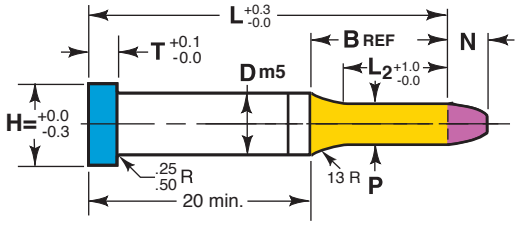
Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. See page 42.

Shank D mm	Shank Catalog No.	Head H mm	Point Length L_2 Std	Point Length L_2 Alt	Standard Lengths L 065	073	082	092	102	112	127	132	142	Standard Point Range	N MAX
10	CDSAP10	13	21	27	●	●	●	●	●	●	●			4.85 – 10.00	8
13	CDSAP13	16	21	27	●	●	●	●	●	●	●	•	•	6.30 – 13.00	10
16	CDSAP16	19	21	27		●	●	●	●	●	●	•	•	9.95 – 16.00	15
20	CDSAP20	23	21	27		●	●	●	●	●	●	•	•	13.60 – 20.00	20
25	CDSAP25	28	21	27		●	●	●	●	●	•	•	•	17.25 – 25.00	25
32	CDSAP32	35	27	32		●	●	●	●	●				20.85 – 32.00	30

All Lengths in Light Blue Panel have Hot Forged Heads for added strength and toughness.

• Available D2 only RC 58-61

Regular Parabolic Pilot–SP Type



B & L Lengths do not include Pilot Tip N

Ordering Example: Qty 13, Steel M2, Type SP, Code 010, L_2/L 21/082, P P=7.55

Steel: D2, Rc 58-61
M2 Rc 60-63 PM4, Rc 63-65
Heads Rc 40-55 (25mm Ø and smaller and L > 50)

TOLERANCES

Round P +0.01 -0.00 | ◎ | 0.01 | P to D

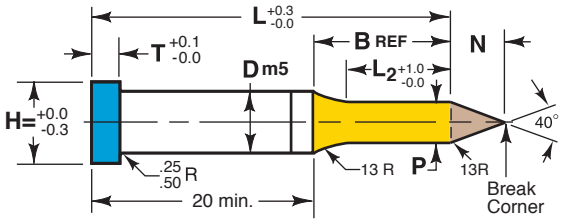
Headless Punch Pilots are also available.
To order call out: Regular Pilot = HSP
Angular Pilot = HAP

Shank		Head		L_2		Lengths L											N	Round
D	Pilot Type	H	T	Std	Alt	047	052	058	062	072	073	082	092	102	112	127	MAX	Range P
4	SP004	7	5	10	15	◆	●	●	●	●	●	●	●				4.0	1.55 – 4.00
5	SP005	8	5	15	21	◆	●	●	●	●	●	●	●				4.0	1.55 – 5.00
6	SP006	9	5	15	21	◆	●	●	●	●	●	●	●				4.0	2.45– 6.00
8	SP008	11	5	21	27		◆	●	●	●	●	●	●	●	●		4.0	3.15 – 8.00
10	SP010	13	5	21	27		◆	●	●	●	●	●	●	●	●	●	4.0	4.45 –10.00
13	SP013	16	5	21	27		◆	●	●	●	●	●	●	●	●	●	4.0	5.95 –13.00
16	SP016	19	5	21	27		◆	●	●	●	●	●	●	●	●	●	4.0	7.95 –16.00
20	SP020	23	5	21	27		●	●	●	●	●	●	●	●	●	●	4.0	9.95 –20.00
25	SP025	28	5	21	27		●	●	●	●	●	●	●	●			4.0	12.00 –25.00
32	SP032	35	5	27	32					●	●	●	●	●			4.0	16.00 –32.00

All Lengths in Light Blue Panel have Hot Forged Heads for added strength and toughness.

◆ Only available in Standard Point length
◆ ● Also available in D2 &PM4

Angular Pilot–SAP Type

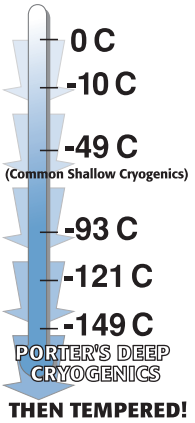


B & L Lengths do not include Pilot Tip N

Ordering Example: Qty 6, Steel M2, Type SAP, Code 025, L_2/L 27/102, P P=20.05

Shank		Head		L_2		Lengths L								N	Round
D	Pilot Type	H	T	Std	Alt	065	072	073	082	092	102	112	127	MAX	Range P
8	SAP008	11	5	21	27	●	●	●	●	●	●	●		7	2.45 – 8.00
10	SAP010	13	5	21	27	●	●	●	●	●	●	●	●	8	4.85 –10.00
13	SAP013	16	5	21	27	●	●	●	●	●	●	●	●	10	6.30 –13.00
16	SAP016	19	5	21	27	●	●	●	●	●	●	●	●	15	9.95 –16.00
20	SAP020	23	5	21	27	●	●	●	●	●	●	●	●	20	13.60 –20.00
25	SAP025	28	5	21	27	●	●	●	●					25	17.25 –25.00
32	SAP032	35	5	21	32	●	●	●						30	20.85 –32.00

● Also available in D2 & PM4



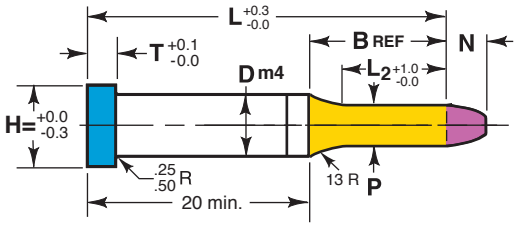
All Standard Punches up to 25mm Dia. are "Deep Cryogenically" treated for
1. Wear
2. Toughness
3. Dimensional Stability

See page 47 for more details.

All Lengths in Light Blue Panel have Hot Forged Heads for added strength and toughness.

Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. See page 42.

Ultra Precision Regular Pilot



B & L Lengths do not include Pilot Tip N

Steel: D2, Rc 58-61, M2 60-63, PM4, Rc 63-65
Heads Rc 40-55 (25mm Ø and smaller and L > 50)

TOLERANCES

Round P +0.005 -0.000	◎ .008	P to D

Headless Punch Pilots are also available.
To order call out: Regular Pilot = HSP
Angular Pilot = HAP

Ordering Example:

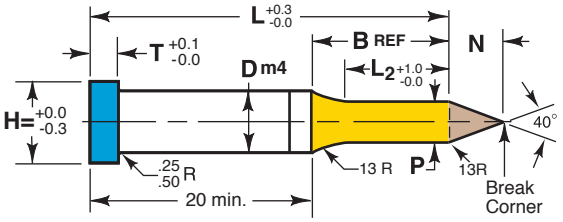
Qty	Steel	Type	Code	L2/L	P
50	M2	PP	004	29/092	P=3.75

Shank		Head		L2				Lengths L												N	Round
D	Pilot Type	H	T	10	15	21	27	047	052	058	062	065	072	073	082	092	102	112	127	MAX	Range P
4	PP004	7	5	●	●	●	●	●	●	●	●	●	●	●	●	●				4.0	1.55 – 4.00
5	PP005	8	5	●	●	●	●	●	●	●	●	●	●	●	●	●				4.0	1.55 – 5.00
6	PP006	9	5	●	●	●	●	●	●	●	●	●	●	●	●	●				4.0	1.55 – 6.00
8	PP008	11	5	●	●	●	●		●	●	●	●	●	●	●	●	●	●		4.0	2.45 – 8.00
10	PP010	13	5	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	4.0	3.15 –10.00
13	PP013	16	5		●	●	●		●	●	●	●	●	●	●	●	●	●	●	4.0	4.95 –13.00
16	PP016	19	5		●	●	●		●	●	●	●	●	●	●	●	●	●	●	4.0	7.95 –16.00
20	PP020	23	5		●	●	●		●	●	●	●	●	●	●	●	●	●	●	4.0	8.95 –20.00
22	PP022	25	5		●	●	●		●	●	●	●	●	●	●	●	●			4.0	9.95 –22.00
25	PP025	28	5		●	●	●		●	●	●	●	●	●	●	●	●			4.0	11.95 –25.00
32	PP032	35	5		●	●	●					●	●	●	●	●	●			4.0	15.95 –32.00

All Lengths in Light Blue Panel have Hot Forged Heads for added strength and toughness.

● Also available in D2 & PM4 — P below 1.60 L2 =10 max — P below 2.50 L2 =21 max

Ultra Precision Angular Pilot-PAP Type



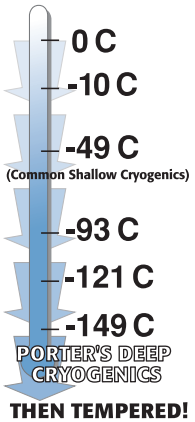
B & L Lengths do not include Pilot Tip N

Ordering Example:

Qty	Steel	Type	Code	L2/L	P
13	D2	PAP	016	21/062	P=10.50

Shank		Head		L2				Lengths L								N	Round
D	Pilot Type	H	T	10	15	21	27	065	072	073	082	092	102	112	127	MAX	Range P
8	PAP008	11	5	●	●	●	●	●	●	●	●	●	●	●		7	2.45 – 8.00
10	PAP010	13	5	●	●	●	●	●	●	●	●	●	●	●	●	8	4.85 –10.00
13	PAP013	16	5	●	●	●	●	●	●	●	●	●	●	●	●	10	6.30 –13.00
16	PAP016	19	5	●	●	●	●	●	●	●	●	●	●	●	●	15	9.95 –16.00
20	PAP020	23	5	●	●	●	●	●	●	●	●	●	●	●	●	20	13.60 –20.00
22	PAP022	25	5	●	●	●	●	●	●	●	●					22	15.00 –22.00
25	PAP025	28	5	●	●	●	●	●	●	●	●					25	17.75 –25.00
32	PAP032	35	5	●	●	●	●	●	●	●						30	20.85 –32.00

● Also available in D2 & PM4 — P below 1.60 L2 =10 max — P below 2.50 L2 =21 max



All Ultra Precision Pilots are "Deep Cryogenically" treated for
1. Wear
2. Toughness
3. Dimensional Stability

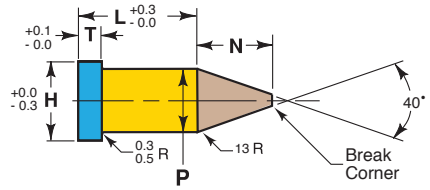
See page 47 for more details.

All Lengths in Light Blue Panel have Hot Forged Heads for added strength and toughness.

Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. See page 42.

Sur-Align Pilots

Sur–Align Straight (SAPQ)



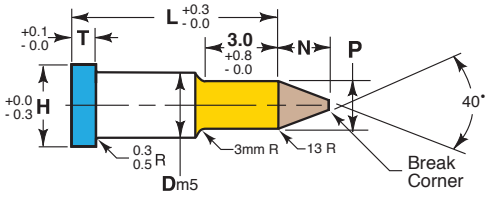
Steel: M2 Rc 60-63
TOLERANCES

P +0.01 -0.00	◎	0.01	P to D

Ordering Example:

Qty	Steel	Type	Code	L	P Dim.	Alt.
10	M2	SAPQ		32	5.50	RL=29
20	M2	SAPN	025	x 25	24.50	

Sur–Align Nibbled (SAPN)



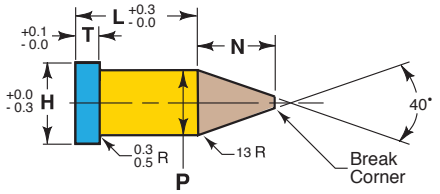
Sur-Align Pilots prevent movement. Reduce standard pilot deflection by mounting Sur-Align in your guide stripper plate.

Type	Range P	Max N	Head T	Head H	Lengths L 16	20	22	25	28	32	35	Shank Type	Shank D	Shank Code	Min P	Range P	Max N
SAPQ	3.00 – 4.00	4	5	7	●	●	●	●	●	●	●	SAPN004	4	004	1.55	1.95 – 3.99	4
SAPQ	4.01 – 5.00	5	5	8	●	●	●	●	●	●	●	SAPN005	5	005	1.55	2.65 – 4.99	5
SAPQ	5.01 – 6.00	6	5	9	●	●	●	●	●	●	●	SAPN006	6	006	2.10	3.40 – 5.99	6
SAPQ	6.01 – 8.00	7	5	11	●	●	●	●	●	●	●	SAPN008	8	008	2.10	4.10 – 7.99	7
SAPQ	8.01 –10.00	8	5	13	●	●	●	●	●	●	●	SAPN010	10	010	2.10	4.8 5– 9.99	8
SAPQ	10.01 –13.00	10	5	16	●	●	●	●	●	●	●	SAPN013	13	013	3.15	6.30 – 12.99	10
SAPQ	13.01 –16.00	15	5	19	●	●	●	●	●	●	●	SAPN016	16	016	5.95	9.95 – 15.99	15
SAPQ	16.01 –20.00	20	5	23		●	●	●	●	●	●	SAPN020	20	020	5.95	13.60 – 19.99	20
			5	28		●	●	●	●	●	●	SAPN025	25	025	7.95	17.25 – 24.99	25
			5	35		●	●	●	●	●	●	SAPN032	32	032	9.95	20.85 – 31.99	30

Any overall length within catalog range no extra cost Specify"RL" plus length.

Ultra Precision Sur-Align Pilots (PAP-)

Sur–Align Straight (PAPQ)



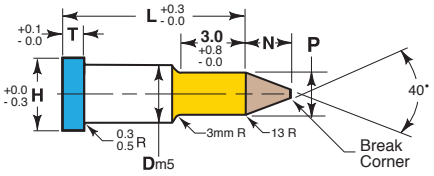
Steel: D2 Rc 58-61, M2 Rc 60-63
PM4 Rc 63-65
TOLERANCES

P +0.005 -0.000	◎	0.008	P to D

Ordering Example:

Qty	Steel	Type	L	P	Alt.
10	D2	PAPQ	32	P=5.50	RL=29

Sur–Align Nibbled (PAPN)



Ordering Example:

Qty	Steel	Type	Code	L	P
20	M2	PAPN	025	28	P=8.02

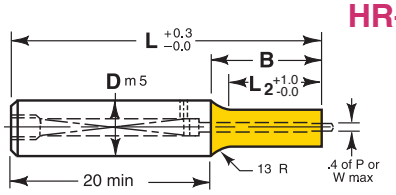
Type	Range P	Max N	Head T	Head H	Lengths L 16	20	22	25	28	32	35	Shank Type	Shank D	Shank Code	Min P	Range P	Max N
PAPQ	3.00 – 4.00	4	5	7	●	●	●	●	●	●	●	PAPN004	4	004	1.55	1.95 – 3.99	4
PAPQ	4.01 – 5.00	5	5	8	●	●	●	●	●	●	●	PAPN005	5	005	1.55	2.65 – 4.99	5
PAPQ	5.01 – 6.00	6	5	9	●	●	●	●	●	●	●	PAPN006	6	006	2.10	3.40 – 5.99	6
PAPQ	6.01 – 8.00	7	5	11	●	●	●	●	●	●	●	PAPN008	8	008	2.10	4.10 – 7.99	7
PAPQ	8.01 –10.00	8	5	13	●	●	●	●	●	●	●	PAPN010	10	010	2.10	4.8 5– 9.99	8
PAPQ	10.01 –13.00	10	5	16	●	●	●	●	●	●	●	PAPN013	13	013	3.15	6.30 – 12.99	10
PAPQ	13.01 –16.00	15	5	19	●	●	●	●	●	●	●	PAPN016	16	016	5.95	9.95 – 15.99	15
PAPQ	16.01 –20.00	20	5	23		●	●	●	●	●	●	PAPN020	20	020	5.95	13.60 – 19.99	20
			5	28		●	●	●	●	●	●	PAPN025	25	025	7.95	17.25 – 24.99	25
			5	35		●	●	●	●	●	●	PAPN032	32	032	9.95	20.85 – 31.99	30

Any overall length within catalog range no extra cost Specify"RL" plus length.

Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. *See page 42.*

Standard Headless Retrakto & Solid Punches

HR-



Steel: M2 Rc 60-63

TOLERANCES

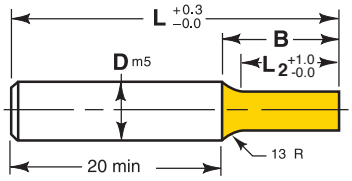
Round P +0.01 −0.00	◎	0.01	P to D
Shape P, W ±0.01	◎	0.02	P,W to D

Back Draft 0.1/100mm L2 max.

Ordering Example:

Qty	Steel	Type	Code	L2/L	P	W	ALT
15	M2	HRO	020	19/063	P=19.99	W=10.25	AD

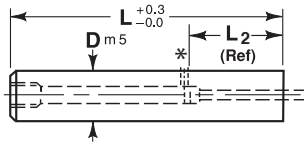
H-



Ordering Example:

Qty	Steel	Type	Code	L2/L	P
25	M2	HC	013	25/080	P=6.00

HRQ



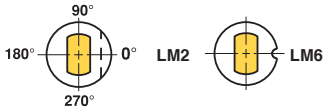
* Side hole location indicated on request

BLANKS

Ordering Example:

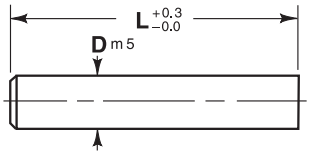
Qty	Steel	Type	Code	L2/L
10	M2	HEQ	025	19/070

D=g5 add AD to callout



Optional **L**ocating **M**ethods See page 44 & 45 for details and options.

HQ



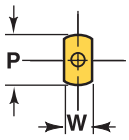
BLANKS

Ordering Example:

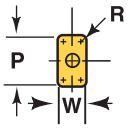
Qty	Steel	Type	Code	L
12	M2	HQ	013	100

HRC / HC

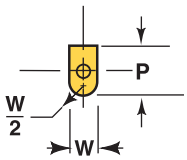
HRF / HF



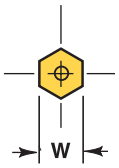
HRK / HK



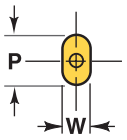
HRJ / HJ



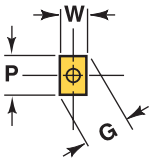
HRN / HN



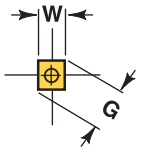
HRO / HO



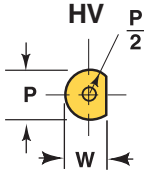
HRR / HR



HRS / HS



HRV / HV

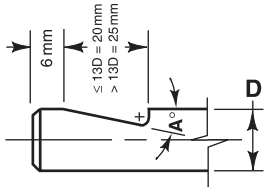


For additional standard forms and configurations see pages 36 - 39.

Shank D mm	Shank Code No.	L2 Std.	L2 Alt.	Lengths L 045	050	056	060	063	070	071	080	090	100	Point Round Range P	Point Shape Min W	Point Shape Max P/G	Replacement Ejector Kit
5	005	13	19	◆	•	•	•	•	•	•	•			1.60 – 4.99	1.60	5.00	K2M
6	006	13	19	◆	•	•	•	•	•	•	•	•	•	2.40 – 5.99	2.40	6.00	K3M
8	008	19	25		◆	•	•	•	•	•	•	•	•	3.20 – 7.99	3.20	8.00	K4M
10	010	19	25		◆	•	•	•	•	•	•	•	•	4.50 – 9.99	4.50	10.00	K6M
13	013	19	25		◆	•	•	•	•	•	•	•	•	6.00 – 12.99	6.00	13.00	K6M
16	016	19	25		◆	•	•	•	•	•	•	•	•	8.00 – 15.99	7.20	16.00	K9M
20	020	19	25		◆	•	•	•	•	•	•	•	•	10.00 – 19.99	8.00	20.00	K9M
25	025	19	25		◆	•	•	•	•	•	•	•	•	12.00 – 24.99	9.00	25.00	K9M

◆ Only available in Standard Point Length. * Ejector Kits available see page 41 for details. 5mm Ø = no side hole.

STD LM-7	
D	A°
≤10mm	5°
13mm	7.5°
≥16mm	10°

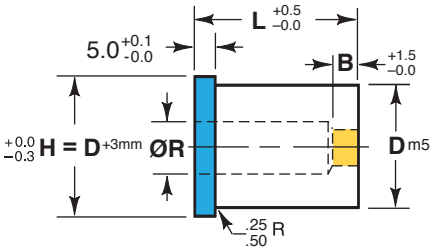


For Shape and Form Headless Punches **Specify LM7** relation to shape.

Standard location is at 0°. Alternate angles are available **Specify LM7 A=12°.**

PORTER® Standard Die Button

HND-



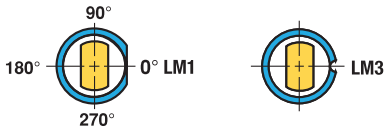
Steel: M2 Rc 60-63

TOLERANCES

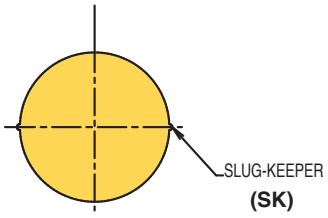
Round P +0.01 −0.00	◎	0.01	P to D
Shape P, W ±0.01	◎	0.02	P,W to D

Ordering Example:

Qty	Steel	Type	Code		L	P
6	M2	HNDC	020	x	25	P=11.00

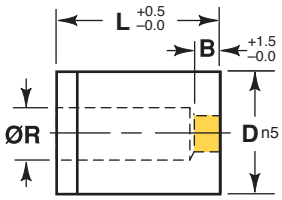


Optional **L**ocating **M**ethods See Page 44 & 45 for details and options.



Porter's Slug keeper can be added to any round or shape die to reduce slug pulling

ND-



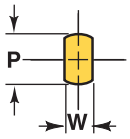
Ordering Example:

Qty	Steel	Type	Code		L	P	W	Locate
6	M2	NDR	016	x	25	P=5.40	W=4.20	LM1

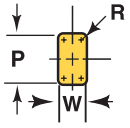
Optional **L**ocating **M**ethods See Page 44 & 45 for details and options.

HNDC / NDC

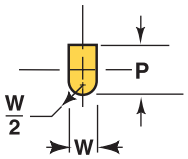
HNDF / NDF



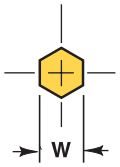
HNDK / NDK



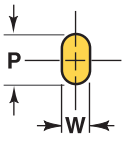
HNDJ / NDJ



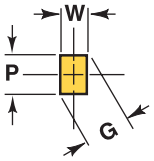
HNDN / NDN



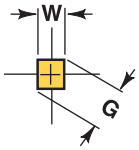
HNDO / NDO



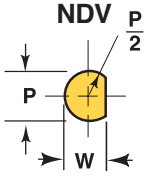
HNDR / NDR



HNDS / NDS



HNDV / NDV



For additional standard forms and configurations see pages 36 - 39.

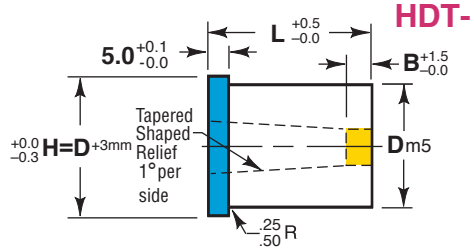
Body D	Code No.	Land B**	Max. R	Lengths								Round ID	Shape ID	
				19	20	22	25	28	30	32	35	Range P	Min. W	Max. P/G
8	008	4	4	N	N	N	●	N	●	●	●	1.5 – 3.2	–	–
10	010	4	6	N	N	N	●	N	●	●	●	1.5 – 5.0	1.5	5.0
13	013	5	8	N	N	N	●	N	●	●	●	1.5 – 7.2	1.5	7.2
16	016	5	9.5	N	N	N	●	N	●	●	●	5.0 – 8.8	1.9	8.8
20	020	5	12	N	N	N	●	N	●	●	●	7.0 – 11.0	1.9	11.0
22	022	6	15	N	N	N	●	N	●	●	●	9.0 – 14.0	1.9	14.0
25	025	6	17.5	N	N	N	●	N	●	●	●	11.0 – 16.5	1.9	16.5
32	032	6	21	N	N	N	●	N	●	●	●	13.0 – 20.0	4.0	20.0
38	038	8	27		N	N	●	N	●	●	●	16.0 – 26.0	4.0	26.0

N = Available ND only. **Additional Land lengths available see page 19 (Taper Relief Dies)

Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. See page 42.

Standard Taper Relief Die Buttons

HDT-



Steel: M2 Rc 60-63, PM4 Rc 63-65

TOLERANCES

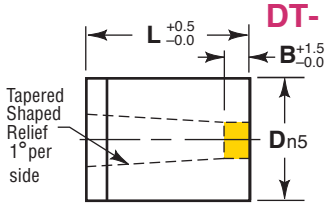
Round P +0.01 -0.00	◎ 0.01	P to D
Shape P, W ±0.01	◎ 0.02	P,W to D

(1) ØD > 40 Tol D = m 5

Ordering Example:

Qty	Steel	Type	Code/B	L	P	W	Locate
5	M2	HDTS	025 x 30		P=4.00	W=4.00	LM2

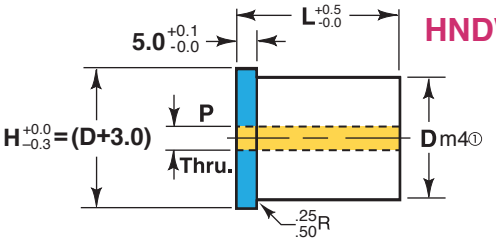
DT-



Ordering Example:

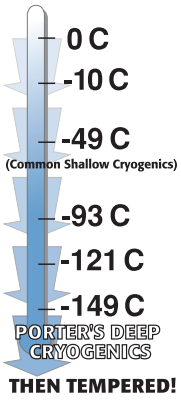
Qty	Steel	Type	Code/B	L	P
10	M2	DTC	050B	x 40	P=20.00

HNDW



Ordering Example:

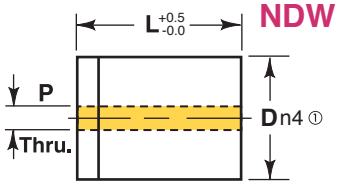
Qty	Type	Code	L
8	HNDW	025	x 32



All Standard Taper Die Buttons are "Deep Cryogenically" treated for
1. Wear
2. Toughness
3. Dimensional Stability

See page 47 for details.

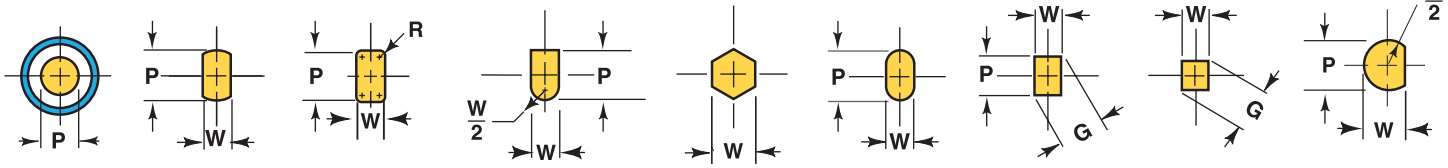
NDW



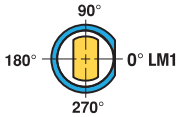
Ordering Example:

Qty	Type	Code	L
6	NDW	016	x 25

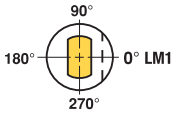
HDTC DTC / HDTF DTF / HDTK DTK / HDTJ DTJ / HDTN DTN / HDTO DTO / HDTR DTR / HDTS DTS / HDTV DTV



For additional standard forms and configurations see pages 36 - 39.



Optional **L**ocating **M**ethods See Page 44 & 45 for details and options.

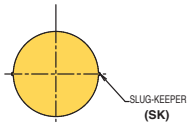


Body D	Code No.	B Std S	B Alt A	B Alt B	Lengths L 13	16	19	20	22	25	28	30	32	35	40	45	50	55	60	Range P	Min. W	Max. P/G	P Thru Hole
5	005	4	5	3	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆						1.30 – 3.20	1.30	3.20	0.8
6	006	4	5	3	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆						1.30 – 3.90	1.30	3.90	0.8
8	008	4	5	3	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆						1.30 – 5.40	1.30	5.40	0.8
10	010	4	5	3	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	•	•	•	•	•	1.60 – 6.80	1.30	6.80	0.8
13	013	5	8	3	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	•	•	•	•	•	3.00 – 8.80	1.90	8.80	1.6
16	016	5	8	3			◆	◆	◆	◆	◆	◆	◆	◆	•	•	•	•	•	7.40 – 10.80	1.90	10.80	6 & 3.0
20	020	5	10	3			◆	◆	◆	◆	◆	◆	◆	◆	•	•	•	•	•	9.50 – 13.60	1.90	13.60	6 & 3.0
22	022	6	10	3			◆	◆	◆	◆	◆	◆	◆	◆	•	•	•	•	•	10.50 – 15.00	1.90	15.00	1.6
25	025	6	10	3			◆	◆	◆	◆	◆	◆	◆	◆	•	•	•	•	•	12.00 – 17.00	1.90	17.00	6 & 3.0
32	032	6	12	3			◆	◆	◆	◆	◆	◆	◆	◆						16.00 – 22.00	4.00	22.00	3.5
38	038	6	12	3			●	●	●	●	●	●	●	●						18.00 – 27.00	4.00	27.00	1.6
40	040	8	12	3			●	●	●	●	●	●	●	●						18.00 – 27.00	4.00	27.00	3.2
45	045	8	12	3					●	●	●	●	●	●						18.00 – 35.00	4.00	35.00	3.2
50	050	8	12	3					D	D	D	D	D	D						18.00 – 40.00	4.00	40.00	3.2

D=Available in DT only. ◆ Also available in PM4 Alter Taper (AT=) • Available D2 only 58-61 Rc

*Alternate lands are available, call out "AB" and land desired (Ex "AB-5"). For perforating stock thickness less than 1 mm thick, the land should be shortened to minimize slug jamming in the die land.

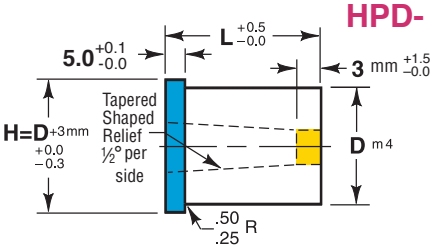
Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. See page 42.



Porter's Slug keeper can be added to any round or shape die to reduce slug pulling

Ultra Precision Die Button

HPD-

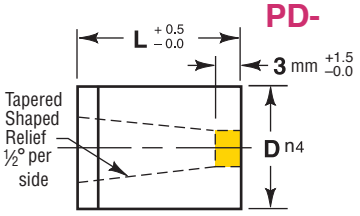


Steel: M2 Rc 60-63, PM4 Rc 63-65

TOLERANCES

ØD ≤ 38.0 P,W +0.005 -0.000	◎	.008	P,W to D
ØD > 38.0 P,W +0.01 -0.00	◎	.012	P,W to D

PD-



Ordering Example:

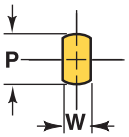
Qty	Steel	Type	Code	L	P
6	M2	HPDC	016 x	25	P=9.00

Ordering Example:

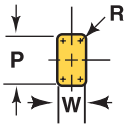
Qty	Steel	Type	Code	L	P	W	Locate
6	M2	PDO	025 x	25	P=12.00	W=6.50	LM1

HPDC PDC

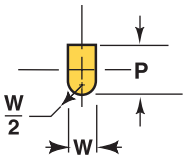
HPDF PDF



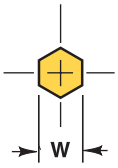
HPDK PDK



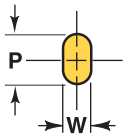
HPDJ PDJ



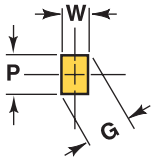
HPDN PDN



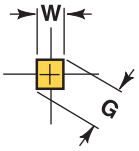
HPDO PDO



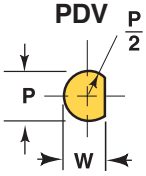
HPDR PDR



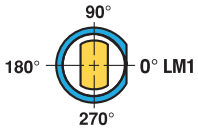
HPDS PDS

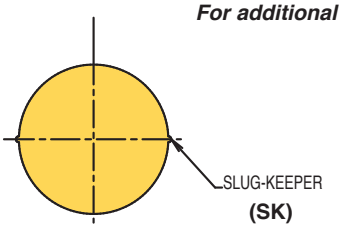


HPDV PDV

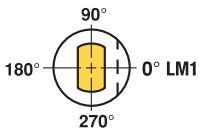


For additional standard forms and configurations see pages 36 - 39.





Porter's Slug keeper can be added to any round or shape die to reduce slug pulling



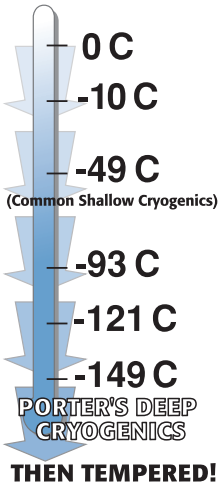
Optional **L**ocating **M**ethods See Page 44 & 45 for details and options.

Body D	Code No.	Lengths L										Range P	Min W	Max P/G
		13	16	19	20	22	25	28	30	32	35			
5	005	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	1.60 – 3.20	1.30	3.20
6	006	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	1.60 – 3.90	1.30	3.90
8	008	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	2.40 – 5.40	1.30	5.40
10	010	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	3.20 – 6.80	1.30	6.80
13	013	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	5.40 – 8.80	1.90	8.80
16	016			◆	◆	◆	◆	◆	◆	◆	◆	7.40 – 10.80	1.90	10.80
20	020			◆	◆	◆	◆	◆	◆	◆	◆	9.50 – 13.60	1.90	13.60
22	022			◆	◆	◆	◆	◆	◆	◆	◆	10.50 – 15.00	1.90	15.00
25	025			◆	◆	◆	◆	◆	◆	◆	◆	12.00 – 17.00	1.90	17.00
32	032			◆	◆	◆	◆	◆	◆	◆	◆	16.00 – 22.00	4.00	22.00
38	038			•	•	•	•	•	•	•	•	18.00 – 27.00	4.00	27.00
40	040			•	•	•	•	•	•	•	•	18.00 – 27.00	4.00	27.00

◆ Also available in PM4

Alter Taper (AT=)

*Standard 3mm thick land is supplied, alternate lands are available, call out "AB" and land desired (Ex "AB-5"). For perforating stock thickness less than 1 mm thick, the land should be shortened to minimize slug jamming in the die land.

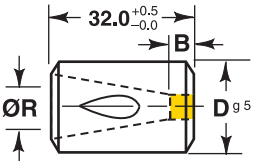


All Ultra Precision die buttons are "Deep Cryogenically" treated for
1. Wear
2. Toughness
3. Dimensional Stability

See page 47 for more details.

Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. See page 42.

Bal-Lok Die Buttons (BD-)



Ordering Example:

Qty	Steel	TypeCode		P
25	M2	BDC	016	P=5.65

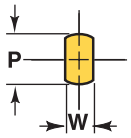
Steel: M2, Rc 60-63

TOLERANCES

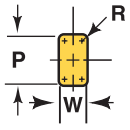
Round P +0.01 -0.00	◎	0.01	P to D
Shape P,W +0.02 -0.00	◎	0.02	P,W to D

BDC

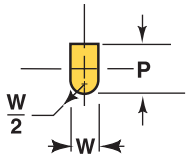
BDF



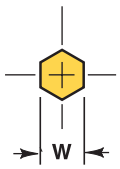
BDK



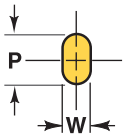
BDJ



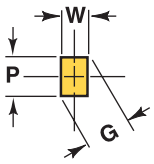
BDN



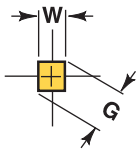
BDO



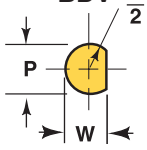
BDR



BDS



BDV



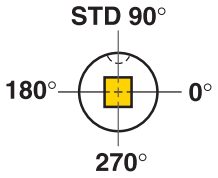
Body Code	Body D	Min. B	Max. R	Length L	Round I.D. Range P	Shape I.D. Min. W	Shape I.D. Max. P/G
13	13	4	6.00	32.0	1.50 – 5.20	1.50	5.20
16	16	4	8.00	32.0	3.20 – 7.20	2.00	7.20
20	20	4	12.00	32.0	4.00 –11.00	2.40	11.00
25	25	5	16.00	32.0	8.00 –15.00	4.00	15.00
32	32	6	20.00	32.0	11.00 –19.00	4.80	19.00
38	38	6	27.00	32.0	16.50 –26.00	6.40	26.00

Supplied with 1% / side taper Alter Taper (AT=)

***SPECIAL NOTE:** Large quantities of Bal-Lok die buttons may be substituted with a stepped relief.

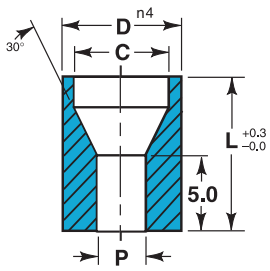
For additional standard forms and configurations see pages 36 - 39.

Standard Ball Seat location is at 90°, alternate locations of 0°, 180° and 270° are availableat no extra charge. See pages 36-39 for additional standard I.D. forms.

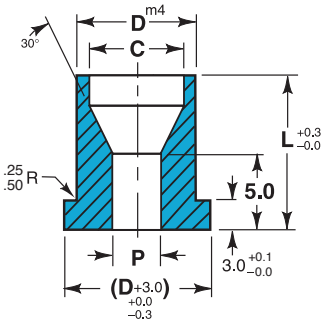


Steel Guide Bushings

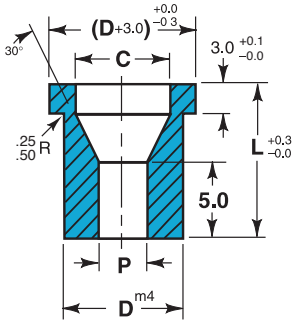
GL–HEADLESS



GD–HEAD-DOWN



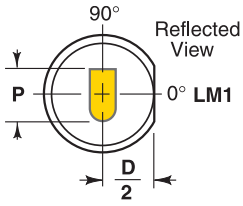
GU–HEAD-UP



Steel: D2 Rc 58-61

TOLERANCES

P & W +0.008 -0.000	◎	0.008	P to D

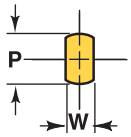


Ordering Example:

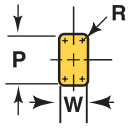
Headless	4 ea.	GLC	010 x 13	P=4.50
Head-Down	4 ea.	GDO	013 x 16	P= 6.00 W=2.50 LM1
Head-Up	4 ea.	GUS	008 x 10	P=3.00 LM1

G-C

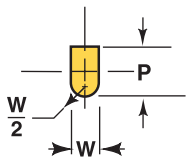
G-F



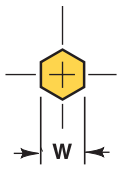
G-K



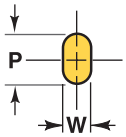
G-J



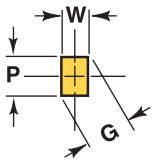
G-N



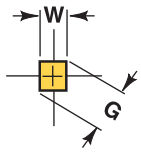
G-O



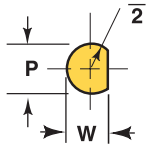
G-R



G-S



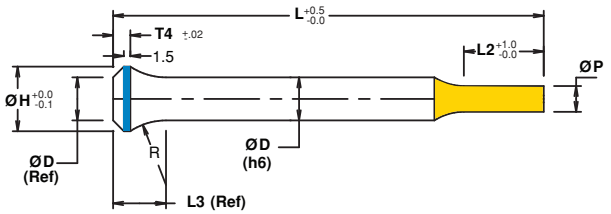
G-V



Body ØD	Code No.	Length L 10.0	13.0	16.0	Circular ID Range P	Shape ID Min. W	Shape ID Max.P/G	ØC ±0.12	Match Punch Shank Ø
6	006	•	•	•	1.50 – 4.00	1.50	4.00	4.37	4.0
8	008	•	•	•	1.50 – 5.00	1.50	5.00	5.37	5.0
10	010	•	•	•	1.50 – 6.00	1.50	6.00	6.37	6.0
13	013		•	•	2.50 – 8.00	2.00	8.00	8.37	8.0
16	016		•	•	3.50 –10.00	3.20	10.00	10.37	10.0
20	020		•	•	5.50 –13.00	4.50	13.00	13.37	13.0
22	022		•	•	8.00 –16.00	6.00	16.00	16.37	16.0
25	025			•	10.00 –20.00	8.00	20.00	20.37	20.0

- Locating flats and dowels, see page 44 & 45.
- Guide Bushing I.D. should be at least .0127mm larger than the punch point that it is used with.

Trumpet Head Punch (TS-)

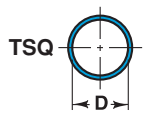


Steel: M2 Rc 60-63 PM4, RC 63-65

TOLERANCES

Round P +0.01 -0.00	◎	0.01	P to D
Shape P, W ±0.01	◎	0.02	P,W to D

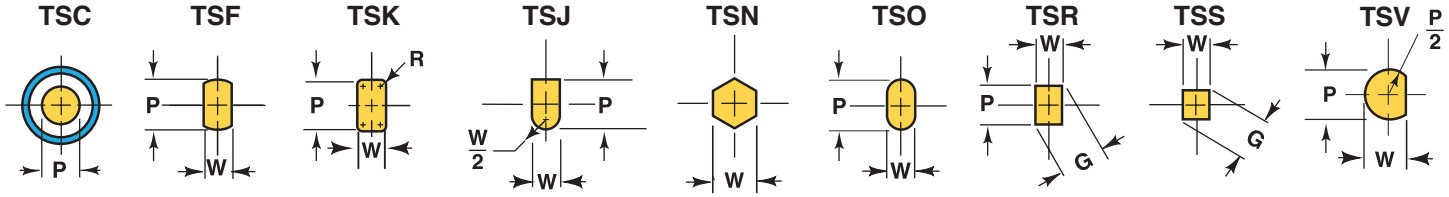
Back Draft 0.1/100mm L_2 max.



BLANKS

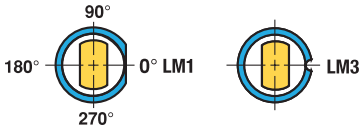
Ordering Example:

Qty	Steel	Type	Code	L_2/L	P	W	Locate
25	M2	TSO	013	25/090	P=12.00	W=6.00	LM2



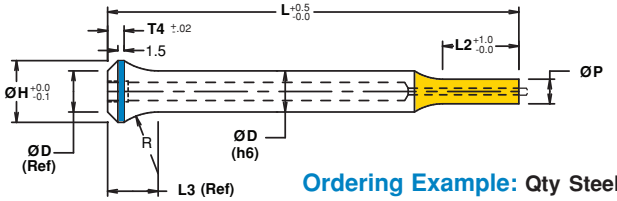
Shank D mm	Shank Code No.	Head H	L_3 Theoretical	L_2 Max	R	Lengths L 070	080	090	100	Point Round Range P	Shape Min W	Shape Max P/G
4	004	5.5	7.38	25	8	•	•	•	•	1.60 – 3.99	1.60	4.00
5	005	7	8.25	25	10	•	•	•	•	1.60 – 4.99	1.60	5.00
6	006	9	9.19	25	10	•	•	•	•	1.60 – 5.99	1.60	6.00
8	008	11	9.72	25	12	•	•	•	•	2.50 – 7.99	2.50	8.00
10	010	14	11.40	25	15	•	•	•	•	3.20 – 9.99	3.20	10.00
13	013	17	11.40	25	15	•	•	•	•	5.00 – 12.99	4.50	13.00
16	016	20	11.40	25	15	•	•	•	•	8.00 – 15.99	6.00	16.00
20	020	25	12.22	25	15	•	•	•	•	10.00 – 19.99	8.00	20.00

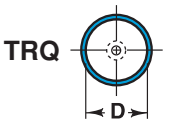
Reflected View



Optional **L**ocating **M**ethods
See page 44 & 45 for details and options.

Trumpet Head Ejector Punches (TR-)

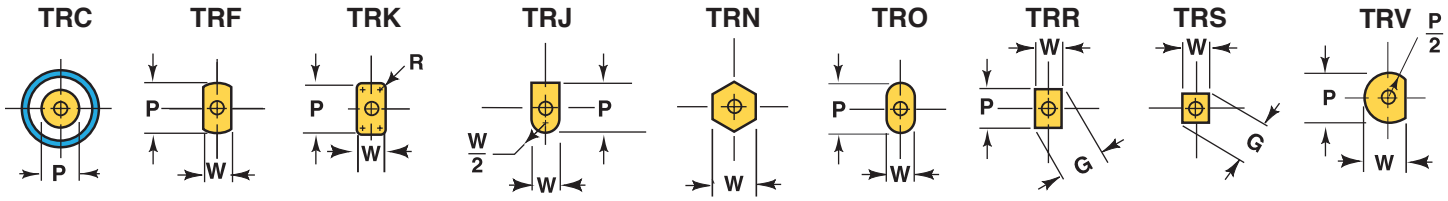




BLANKS

Ordering Example:

Qty	Steel	Type	Code	L_2/L	P
13	M2	TRC	013	19/071	P=10.50



Shank D mm	Shank Code No.	Head H	L_3 Theoretical	L_2 Max	Lengths L 071	080	090	100	Point Round Range P	Shape Min W	Shape Max P/G	Replacement Ejector Kit*
5	005	7	8.25	25	•	•	•	•	1.60 – 4.99	1.60	5.00	K2M
6	006	9	9.19	25	•	•	•	•	2.40 – 5.99	2.40	6.00	K3M
8	008	11	9.72	25	•	•	•	•	3.20 – 7.99	3.20	8.00	K4M
10	010	14	11.40	25	•	•	•	•	4.50 – 9.99	4.50	10.00	K6M
13	013	17	11.40	25	•	•	•	•	6.00 – 12.99	6.00	13.00	K6M
16	016	20	11.40	25	•	•	•	•	8.00 – 15.99	7.20	16.00	K9M
20	020	25	12.22	25	•	•	•	•	10.00 – 19.99	8.00	20.00	K9M

* Ejector punches M2 only

For additional standard forms and configurations see pages 36 - 39.

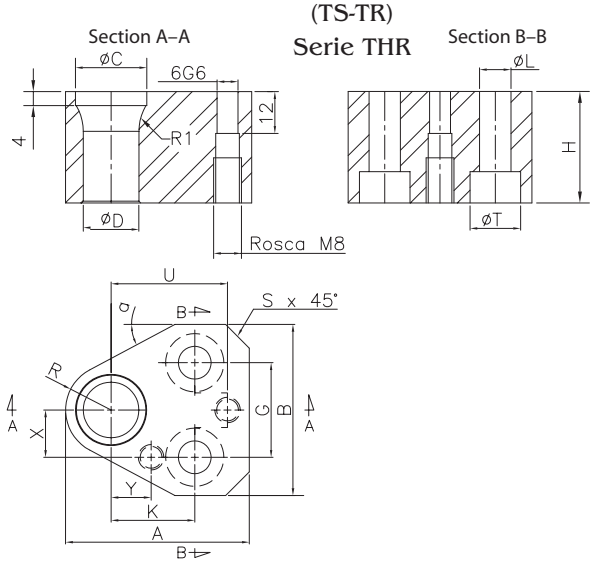
Retainer for Trumpet Head Punch

Material:
– Retainer:
SAE 4140 / 43 – 48 HRc

How to Order:
Quantity=3
Catalog Number: THR.013

Retainer Includes:
– 2 Screws
– 2 Dowels

For Trumpet Head Punch
(TS-TR)
Serie THR



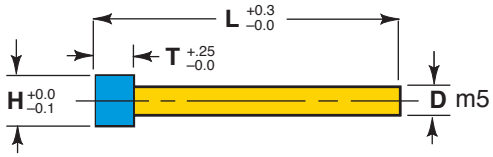
Catalog Number	ØD K6	C	A	B	H	R	S	G	K	Y	U	X	L	T	R1	a°
THR006	6	9,5	35,0	37,5	25,0	8,0	5,0	22,20	19,00	9,0	23,000	8,0	7	12,0	10	30°
THR008	8	11,5	44,3	41,0	25,0	9,5	5,0	22,24	19,05	7,5	26,925	9,0	9	14,5	12	30°
THR010	10	14,5	44,3	41,0	32,0	9,5	5,0	22,24	19,05	7,5	26,925	9,0	9	14,5	15	30°
THR013	13	17,5	50,4	47,0	32,0	12,5	7,5	28,54	19,05	6,5	29,970	12,0	9	14,5	15	28°
THR016	16	20,5	53,5	50,0	32,0	14,0	8,5	31,74	19,05	6,0	31,750	13,5	9	14,5	15	28°
THR020	20	25,5	60,1	55,0	41,0	17,5	10,0	34,94	19,05	5,0	33,530	16,5	11	18,5	15	28°

Trumpet Head Cutters

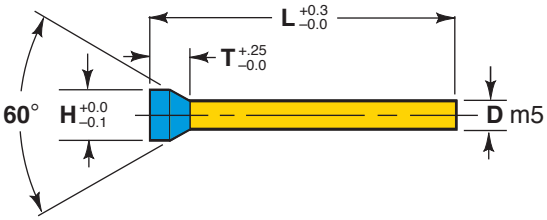
Catalog Number	D
THC006	6
THC008	8
THC010	10
THC013	13
THC016	16
THC020	20

A, B, AB, NA, NB, NAB & Pilot Perforators

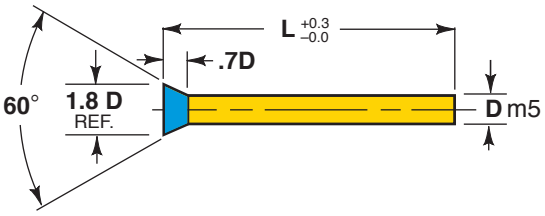
Head Type Perforators (B)



Head Type Perforators (AB)



Head Type Perforators (A)



Steel: M2 Rc 60-63
Heads Rc 40-55 (L > 50)

TOLERANCES

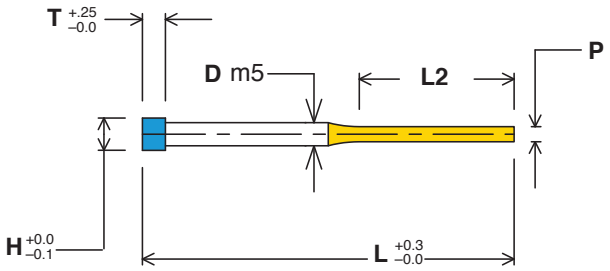
P +.01 −.00	◎ .008	P to D

D Range .8-7.0 D=m5

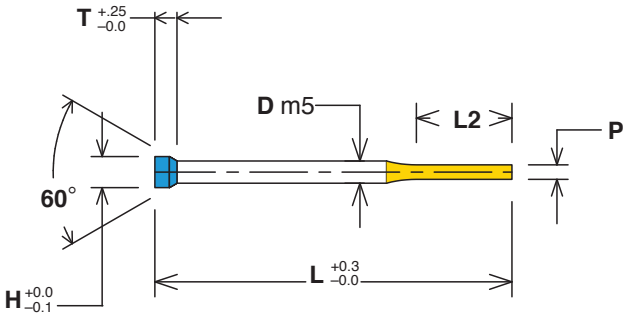
Ordering Example:

Qty.	Style	D	L	H	T
12	B	3.00 x 50		H=5.0	T=3.0

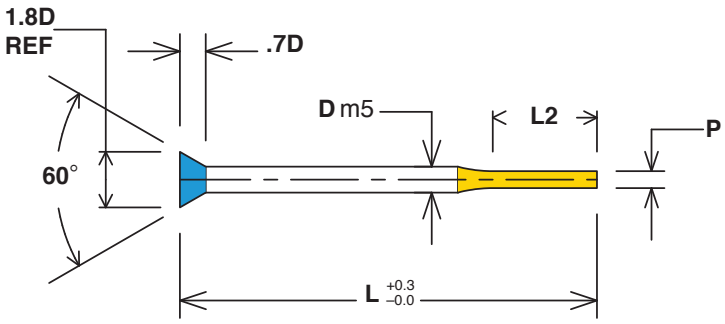
Pointed Perforators NB



Pointed Perforators NAB



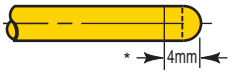
Pointed Perforators NA



Ordering Example:

Qty.	Style	D	L	H	T	P	L_2
12	NA	4.02 x 50				P=2.00	L_2=12.00
12	NB	4.02 x 50		H=5.00	T=5.00	P=2.00	L_2=10.00

Pilot Tips (P)



(PILOT)

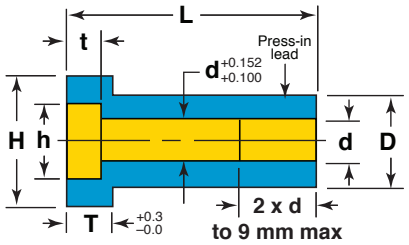
Ordering Example:

Qty.	Style	D	L	H	T	P	L_2
6	PB	4.00	x63	H=6.00	T=4.00		
6	PNB	4.00	x63	H=6.00	T=4.00	P=3.00	L_2=13.00

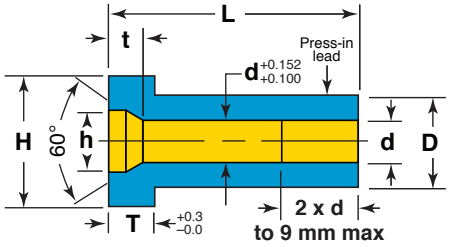
*Adds 6mm max to (L) on all perforators
Angle Pilots (AP)

CQ Perforator Holders

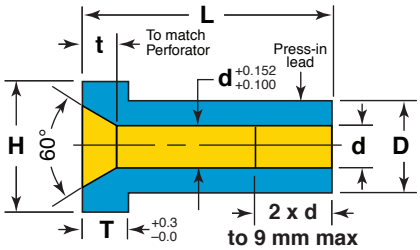
Style B Head



Style AB Head



Style A Head



Catalog No.	D m6	m6 Chart	L 20	25	32	38	45	50	d 0.01 Increment	d Tol. F7	h	t
CQ–04	4	+0.012	•	•	•				1.00– 1.49	+0.021 +0.010	Punch head diameter +0.35	Head thickness Diameter +.20 +.00
CQ–06	6	+0.005	•	•	•	•			1.50– 3.00			
CQ–08	8	+0.015	•	•	•	•			3.01– 4.29	+0.027 +0.013		
CQ–10	10	+0.007	•	•	•	•	•		4.30– 6.00			
CQ–13	13	+0.018		•	•	•	•	•	6.01– 8.09	+0.033 +0.016		
CQ–16	16	+0.008		•	•	•	•	•	8.10– 9.29			
CQ–20	20	+0.021			•	•	•	•	9.30–10.00	+0.040 +0.020		
CQ–22	22	+0.009			•	•	•	•	10.01–10.49			

Customer must supply perforator dimensions with order

Ordering Example:

Qty.	Cat. No.	x	L	x	d	Style
12	CQ-08	x	20		d=4.00	AB

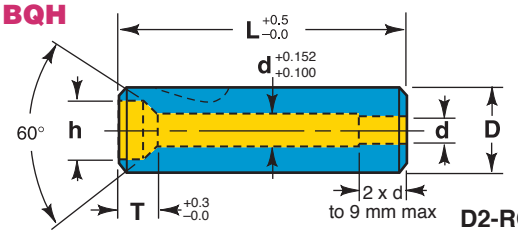
Steel: D2, Rc 59-62

TOLERANCES

0.01	◎

Support Quill Series

BQH



D2-RC 59-62

Ordering Example:

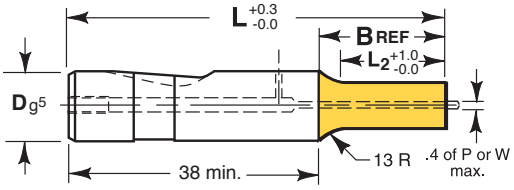
Qty.	Cat. No.	x	L	Head Style
3	BQH-013	x	32	AB

Light-Duty Ball Seat

Catalog No.	D G6	Length L	d +0.027 +0.013	h	t
BHQ–010	10	Perforator (L) - 6mm	Perforator (D) +.027 +.013	Perforator (H) +.20 +.10	Perforator (T) +2.0 -0.0
BHQ–013	13				
BHQ–016	16				
BHQ–020	20				
BHQ–025	25				
BHQ–032	32				

Customer must supply perforator dimensions with order

Heavy Duty Bal-Lok Retrakto Punch (HBR-)

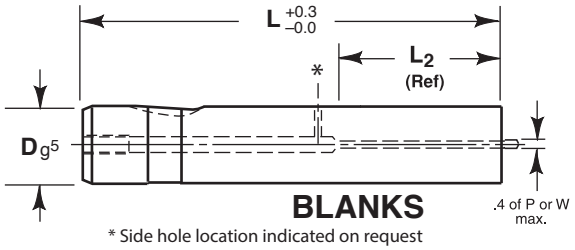


Steel: M2 Rc 60-63
PM4 Rc 63-65

TOLERANCES

Round P +0.01 -0.00	◎	0.01	P to D
Shape P, W ±0.01	◎	0.02	P,W to D

Back Draft 0.1/100mm L_2 max.



BLANKS

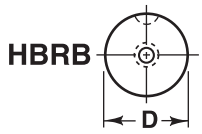
* Side hole location indicated on request

Ordering Example:

Qty	Steel	Type	Code	L_2/L	P	W
12	M2	HBRS	013	25/090	P=9.95	W=9.95

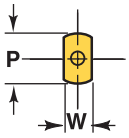
Ordering Example:

Qty	Steel	Type	Code	L_2/L
25	M2	HBRB	025	13/080

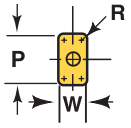


HBRC

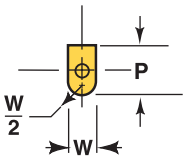
HBRF



HBRK

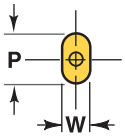


HBRJ

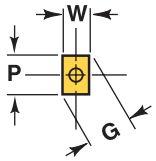


HBRN

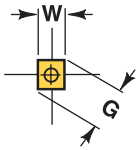
HBRO



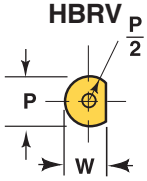
HBRR



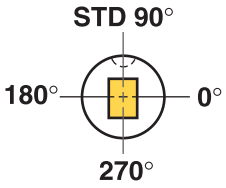
HBRS



HBRV



For additional standard forms and configurations see pages 36 - 39.



Standard ball seat location is at 90° using reflected view for punches. Alternate locations of 0°, 180° and 270° are available at no extra charge. Custom ball seat locations can be specified as number of degrees counterclockwise from 0° Example call out: BS 180°

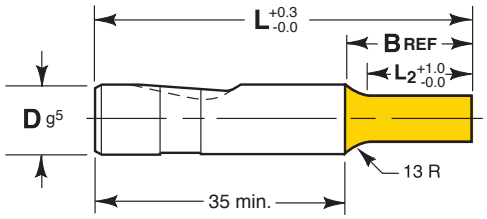
Shank D mm	Shank Code No.	Point Length L_2 Std.	Point Length L_2 Alt.	Point Length L_2 Alt.	Lengths L 063	071	080	090	100	110	125	Point Round Range P	Point Shape Min W	Point Shape Max P/G	Replacement Ejector Kit*
10	010	19	10		●	●	●	●	●	•		3.00 – 9.97	3.00	9.97	K4M
13	013	19	13	25	◆	●	●	●	●	•	•	5.00 – 12.97	4.50	12.97	K6M
16	016	19	13	25	◆	●	●	●	●	•	•	8.00 – 15.97	6.00	15.97	K6M
20	020	19	13	25	◆	●	●	●	●	•	•	12.00 – 19.97	8.00	19.97	K9M
25	025	19	13	25		●	●	●	●	•	•	16.00 – 24.97	10.00	24.97	K9M
32	032	19	13	25		•	•	•	•	•	•	24.00 – 31.97	12.50	31.97	K12M
40	040	25	19	30			•	•	•	•	•	30.00 – 39.97	14.00	39.97	K12M

◆ = L_2, 25 not available 32 mm Ø + larger = no side hole. *Ejector Kits available see page 41 for details.

◆ ● Also available in PM4

Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. See page 42.

Heavy Duty Bal-Lok Solid Punch (HB-)



Steel: M2 Rc 60-63
PM4 Rc 63-65

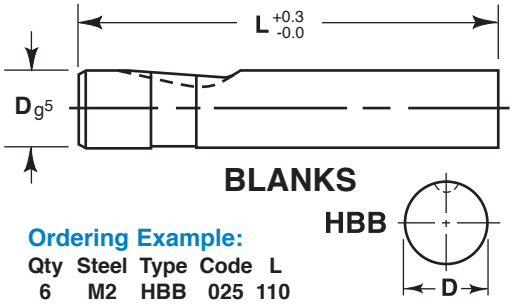
TOLERANCES

Round P +0.01 -0.00	◎	0.01	P to D
Shape P, W ±0.01	◎	0.02	P,W to D

Back Draft 0.1/100mm L_2 max.

Ordering Example:

Qty	Steel	Type	Code	L_2/L	P	W
13	M2	HBO	016	19/080	P=15.00	W=7.50



BLANKS

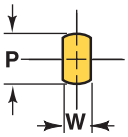
HBB

Ordering Example:

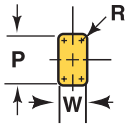
Qty	Steel	Type	Code	L
6	M2	HBB	025	110

HBC

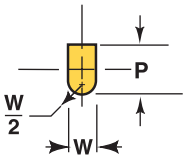
HBF



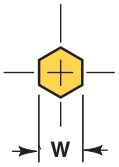
HBK



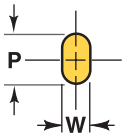
HBJ



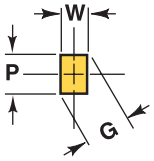
HBN



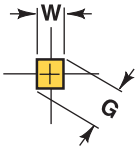
HBO



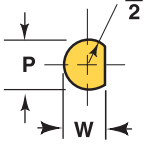
HBR



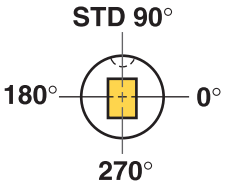
HBS



HBV



For additional standard forms and configurations see pages 36 - 39.



Standard ball seat location is at 90° using reflected view for punches. Alternate locations of 0°, 180° and 270° are available at no extra charge. Custom ball seat locations can be specified as number of degrees counterclockwise from 0° Example call out: BS 180°

Shank		Point Length L_2			Lengths L								Point		
													Round	Shape	
D mm	Code No.	Std.	Alt.	Alt.	063	071	080	090	100	110	125	150	Range P	Min W	Max P/G
10	010	19	10		●	●	●	●	●	•			2.10 – 9.97	2.10	9.97
13	013	19	13	25	◆	●	●	●	●	•	•	•	5.00 – 12.97	4.50	12.97
16	016	19	13	25	◆	●	●	●	●	•	•	•	8.00 – 15.97	6.00	15.97
20	020	19	13	25	◆	●	●	●	●	•	•	•	12.00 – 19.97	8.00	19.97
25	025	19	13	25		●	●	●	●	•	•	•	16.00 – 24.97	10.00	24.97
32	032	19	13	25		•	•	•	•	•	•	•	24.00 – 31.97	12.50	31.97
40	040	25	19	30			•	•	•	•	•		30.00 – 39.97	14.00	39.97

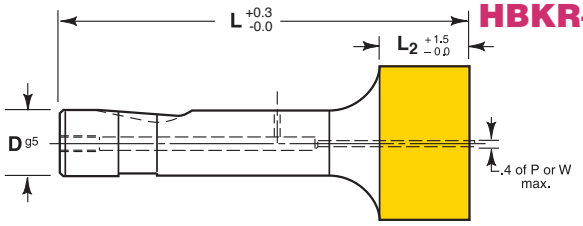
◆ = L2, 25 is not available.

◆ ● Also available in PM4

Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. See page 42.

Heavy Duty Knob Style Punches

HBKR–



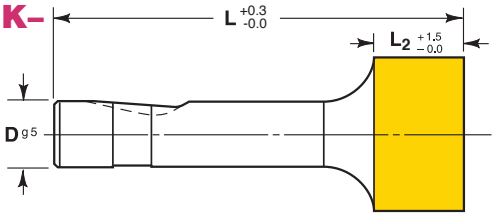
Steel: M2 Rc 60-63

TOLERANCES

Round P +0.01 -0.00	◎	0.01	P to D
Shape P, W ±0.01	◎	0.02	P,W to D

Back Draft 0.1/100mm L_2 max.

HBK–



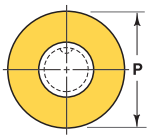
Ordering Example:

Qty	Steel	Type	Code	L	P
4	M2	HBRKC	016	090	P=32.00

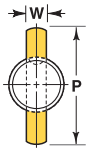
Ordering Example:

Qty	Steel	Type	Code	L	W	P
6	M2	HBKR	032	080	W=15.00	P=30.00

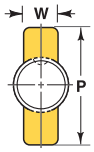
HBKC HBKRC



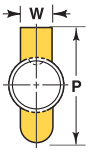
HBKF HBKRF



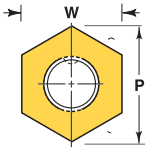
HBKK HBKRK



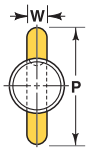
HBKJ HBKRJ



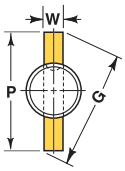
HBKN HBKRN



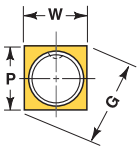
HBKO HBKRO



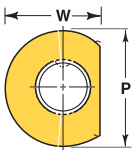
HBKR HBKRR



HBKS HBKRS



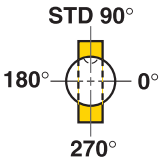
HBKV HBKRV



For additional standard forms and configurations see pages 36 - 39.

Shank D mm	Shank Code No.	Point Length L_2	Lengths L 080	Lengths L 090	Lengths L 100	Point Round Range P	Point Shape Min W	Point Shape Max P/G	Replacement Retrakto Kit*
13	013	20	●	●	●	13.10 – 32.00	5.00	32.00	K6M
16	016	25	●	●	●	16.10 – 38.00	6.00	38.00	K6M
20	020	25	●	●	●	20.10 – 40.00	8.00	40.00	K9M
25	025	25	●	●	●	25.10 – 44.00	10.00	44.00	K9M
32	032	32	●	●	●	32.10 – 50.00	11.50	50.00	K12M
40	040	32	●	●	●	40.10 – 56.00	14.00	56.00	K12M

*Ejector Kits available see page 41 for details.



Standard ball seat location is at 90° using reflected view for punches. Alternate locations of 0°, 180° and 270° are available at no extra charge. Custom ball seat locations can be specified as number of degrees counter-clockwise from 0°.

Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. See page 42.

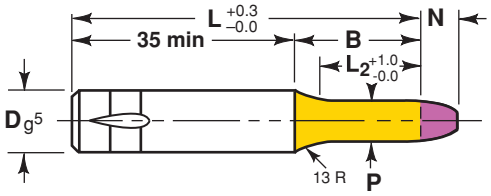
All shank to largest point diameter will be supplied with 13 mm metric radius blend unless otherwise specified. All inside corners will be supplied with .8 mm metric max. radius blend unless otherwise specified.

Bal-Lok Release Tools

BRT 8

BRT 9

Regular Pilot–HBP Type



Steel: M2 Rc 60-63
PM4 Rc 63-65
TOLERANCES

P +0.01 -0.00	◎	0.01	P to D

B & L Lengths do not include Pilot Tip N

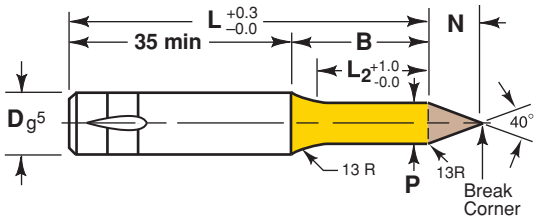
Ordering Example:

Qty	Steel	Type	Code	L_2/L	P
15	M2	HBP	016	15/082	P=9.25

Shank		Lengths L_2			Lengths L							N	Round
D	Pilot Type	Std.	Alt.	Alt.	065	073	082	092	102	112	127	MAX	Range P
10	HBP010	21	12		●	●	●	●	●	●		4.0	2.05 – 9.97
13	HBP013	21	15	27	◆	●	●	●	●	●	●	4.0	4.95 – 12.97
16	HBP016	21	15	27	◆	●	●	●	●	●	●	4.0	7.95 – 15.97
20	HBP020	21	15	27	◆	●	●	●	●	●	●	4.0	11.95 – 19.97
25	HBP025	21	15	27	◆	●	●	●	●	●	●	4.0	15.95 – 24.97
32	HBP032	21	15	27	◆	●	●	●	●	●	●	4.0	23.95 – 31.97
40	HBP040	27	21	32		●	●	●	●	●		4.0	29.95 – 39.97

◆ = L_2, 27 not available ◆ ● Also available in PM4

Angular Pilot–HBAP Type



B & L Lengths do not include Pilot Tip N

Ordering Example:

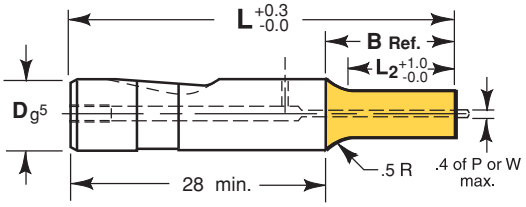
Qty	Steel	Type	Code	L_2/L	P
19	M2	HBAP	010	19/080	P=7.77

Shank		Lengths L_2		Lengths L					N	Round
D	Pilot Type	Std.	Alt.	080	090	100	110	125	MAX	Range P
10	HBAP010	19	32	●	●	●	●		8	5.00 – 9.97
13	HBAP013	19	32	●	●	●	●	●	10	9.00 – 12.97
16	HBAP016	25	38	●	●	●	●	●	15	12.00 – 15.97
20	HBAP020	25	38	●	●	●	●	●	20	15.00 – 19.97
25	HBAP025	25	38	●	●	●	●	●	25	19.00 – 24.97
32	HBAP032	25	38	●	●	●	●		30	24.00 – 31.97

● Also available in PM4

Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. *See page 42.*

Light Duty Bal-Lok Retrakto Punch (BR-)

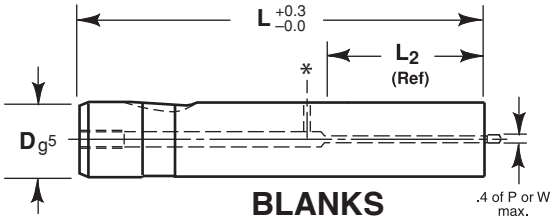


Steel: M2 Rc 60-63

TOLERANCES

Round P +0.01 -0.00	◎ 0.01	P to D
Shape P, W ±0.01	◎ 0.02	P,W to D

Back Draft 0.1/100mm L_2 max.



BLANKS

* Side hole location indicated on request

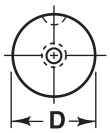
Ordering Example:

Qty	Steel	Type	Code	L_2/L	P	W
10	M2	BRR	010	19/071	P=5.50	P=3.00

Ordering Example:

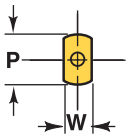
Qty	Steel	Type	Code	L
15	M2	BRB	025	13/080

(BRB)

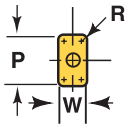


BRC

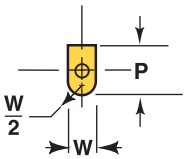
BRF



BRK

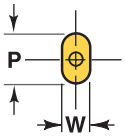


BRJ

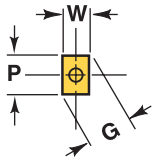


BRN

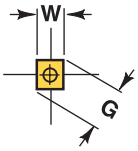
BRO



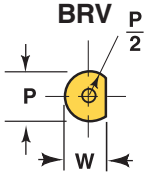
BRR



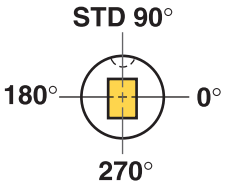
BRS



BRV



For additional standard forms and configurations see pages 36 - 39.



Standard ball seat location is at 90° using reflected view for punches. Alternate locations of 0°, 180° and 270° are available at no extra charge. Custom ball seat locations can be specified as number of degrees counterclockwise from 0° Example call out: BS 180°

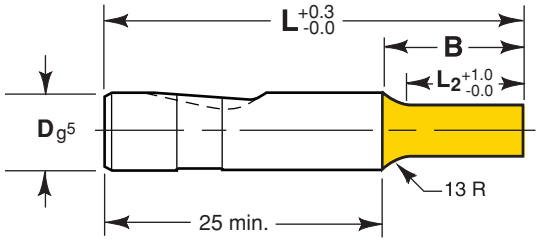
Shank		Point Length			Lengths					Point			Replacement
D	Code	L_2			L					Round	Shape		Ejector
mm	No.	Std.	Alt.	Alt.	063	071	080	090	100	Range P	Min W	Max P/G	Kit*
6	006	13	10		•	•	•	•	•	2.10 – 5.97	2.10	5.97	K3M
10	010	19	10		•	•	•	•	•	2.10 – 9.97	2.10	9.97	K3M
13	013	19	13		•	•	•	•	•	5.00 –12.97	4.50	12.97	K6M
16	016	19	13	25	•	•	•	•	•	8.00 –15.97	6.00	15.97	K6M
20	020	19	13	25	•	•	•	•	•	12.00 –19.97	8.00	19.97	K9M
25	025	19	13	25	•	•	•	•	•	16.00 –24.97	10.00	24.97	K9M
32	032	19	13	25		•	•	•	•	24.00 –31.97	12.50	31.97	K12M

*Ejector kits available see page 41 for details.

32 mm Ø = no side hole

Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. See page 42.

Light Duty Bal-Lok Solid Punch (B-)

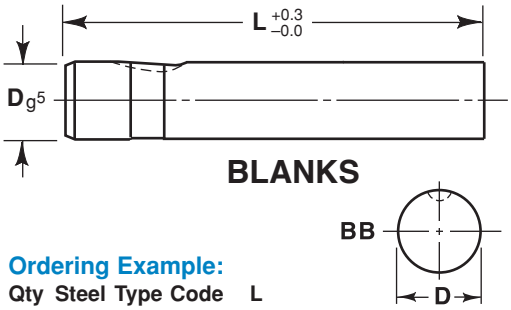


Steel: M2 Rc 60-63

TOLERANCES

Round P +0.01 -0.00	◎	0.01	P to D
Shape P, W ±0.01	◎	0.02	P,W to D

Back Draft 0.1/100mm L_2 max.



Ordering Example:

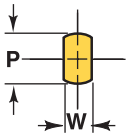
Qty	Steel	Type	Code	L_2/L	P	W
15	M2	BS	025	25/080	P=13.00	P=13.00

Ordering Example:

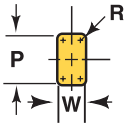
Qty	Steel	Type	Code	L
25	M2	BB	016	080

BC

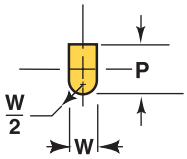
BF



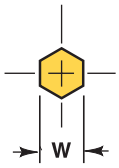
BK



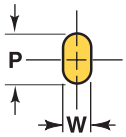
BJ



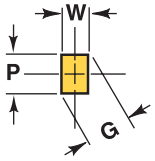
BN



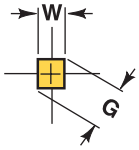
BO



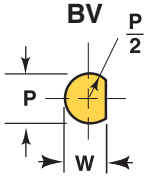
BR



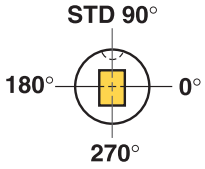
BS



BV



For additional standard forms and configurations see pages 36 - 39.

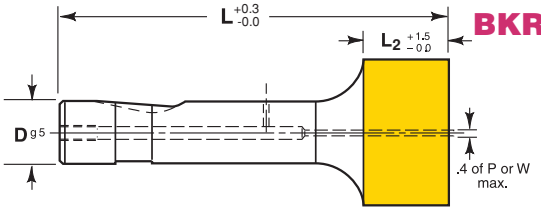


Standard ball seat location is at 90° using reflected view for punches. Alternate locations of 0°, 180° and 270° are available at no extra charge. Custom ball seat locations can be specified as number of degrees counterclockwise from 0° Example call out: BS 180°

Shank		Point Length L_2			Lengths L								Point		
D mm	Code No.	Std.	Alt.	Alt.	063	071	080	090	100	107	118	131	Round Range P	Shape Min W	Shape Max P/G
6	006	13	10		•	•	•	•	•				2.10 – 5.97	2.10	5.97
10	010	19	10		•	•	•	•	•				2.10 – 9.97	2.10	9.97
13	013	19	13	25	•	•	•	•	•	•	•	•	5.00 –12.97	4.50	12.97
16	016	19	13	25	•	•	•	•	•	•	•	•	8.00 –15.97	6.00	15.97
20	020	19	13	25	•	•	•	•	•	•	•	•	12.00 –19.97	8.00	19.97
25	025	19	13	25	•	•	•	•	•	•	•	•	16.00 –24.97	10.00	24.97
32	032	19	13	25		•	•	•	•	•	•	•	24.00 –31.97	12.50	31.97

Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. See page 42.

Light Duty Knob Style Punches



BKR–

Steel: M2 Rc 60-63

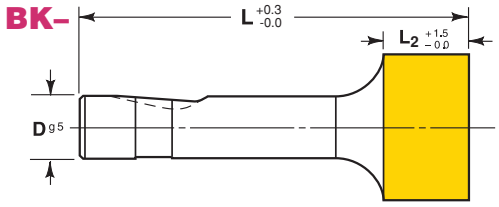
TOLERANCES

Round P +0.01 -0.00	◎	0.01	P to D
Shape P, W ±0.01	◎	0.02	P,W to D

Back Draft 0.1/100mm L_2 max.

Ordering Example:

Qty	Steel	Type	Code	L	P
15	M2	BRKC	013	080	P=25.20

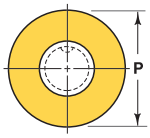


BK–

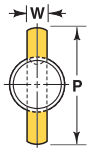
Ordering Example:

Qty	Steel	Type	Code	L	P	W
4	M2	BKS	020	100	P=23.00	P=23.00

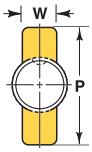
BKC BKRC



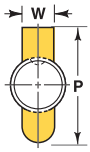
BKF BKRF



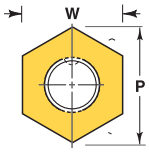
BKK BKRK



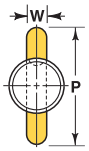
BKJ BKRJ



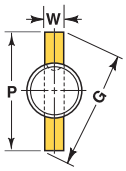
BKN BKRN



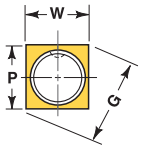
BKO BKRO



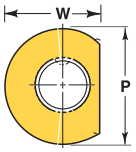
BKR BKRR



BKS BKRS



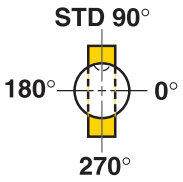
BKV BKRV



For additional standard forms and configurations see pages 36 - 39.

Shank D mm	Shank Code No.	Point Length L_2	Lengths L 080	090	100	Point Round Range P	Point Shape Min W	Point Shape Max P/G	Replacement Ejector Kit*
13	013	20	●	●	●	13.10 – 32.00	5.00	32.00	K6M
16	016	25	●	●	●	16.10 – 38.00	6.00	38.00	K6M
20	020	25	●	●	●	20.10 – 40.00	8.00	40.00	K9M
25	025	25	●	●	●	25.10 – 44.00	10.00	44.00	K9M
32	032	32	●	●	●	32.10 – 50.00	11.50	50.00	K12M

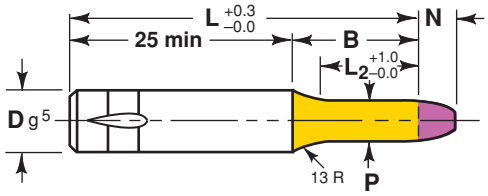
*Ejector Kits available see page 41 for details.



Standard ball seat location is at 90° using reflected view for punches. Alternate locations of 0°, 180° and 270° are available at no extra charge. Custom ball seat locations can be specified as number of degrees counterclockwise from 0°.

Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. See page 42.

Regular Parabolic Pilot–BP



Steel: M2 Rc 60-63

TOLERANCES

P +0.01 -0.00 | ◎ | 0.01 | P to D

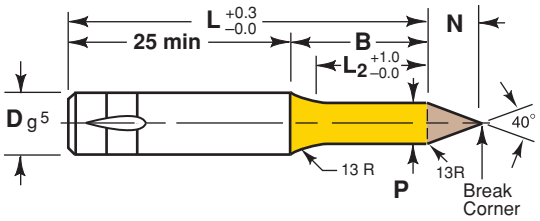
B & L Lengths do not include Pilot Tip N

Ordering Example:

Qty	Steel	Type	Code	L_2/L	P
7	M2	BP	020	27/092	P=15.00

Shank		Lengths L_2			Lengths L							N	Round
D	Pilot Type	Std.	Alt.	Alt.	065	073	082	092	102	112	127	MAX	Range P
6	BP006	15	12		●	●	●	●	●			4.0	2.05 – 5.97
10	BP010	21	12		●	●	●	●	●	●		4.0	2.05 – 9.97
13	BP013	21	15	27	●	●	●	●	●	●	●	4.0	4.95 – 12.97
16	BP016	21	15	27		●	●	●	●	●	●	4.0	7.95 – 15.97
20	BP020	21	15	27		●	●	●	●	●	●	4.0	11.95 – 19.97
25	BP025	21	15	27		●	●	●	●	●	●	4.0	15.95 – 24.97
32	BP032	21	15	27				●	●	●	●	4.0	23.95 – 31.97

Angular Pilot–BAP Type



B & L Lengths do not include Pilot Tip N

Ordering Example:

Qty	Steel	Type	Code	L_2/L	P
19	M2	BAP	010	19/080	P=7.77

Shank		Lengths L_2		Lengths L					N	Round
D	Pilot Type	Std.	Alt.	071	080	090	100	110	MAX	Range P
10	BAP010	19	32	●	●	●	●	●	8.0	5.00 – 9.97
13	BAP013	19	32	●	●	●	●	●	10.0	9.00 – 12.97
16	BAP016	25	38	●	●	●	●	●	15.0	12.00 – 15.97
20	BAP020	25	38	●	●	●	●	●	20.0	15.00 – 19.97
25	BAP025	25	38	●	●	●	●	●	25.0	19.00 – 24.97
32	BAP032	25	38		●	●	●		30.0	24.00 – 31.97

Standard Alterations are changes that are beyond the ranges listed in the catalog that can be altered for a minimal charge. *See page 42.*

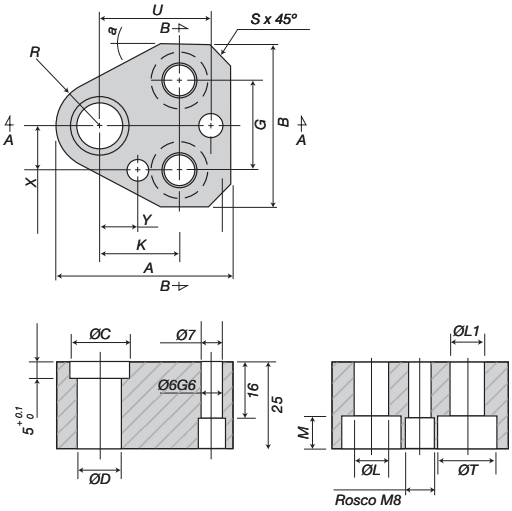
Head Type Retainers - Round

Retainer Set Includes:
- 2 Screws
- 2 Dowels

Material:
Retainer: SAE 4140/43-48 HRc.

Catalog #:
MRR xxx

S



METRIC

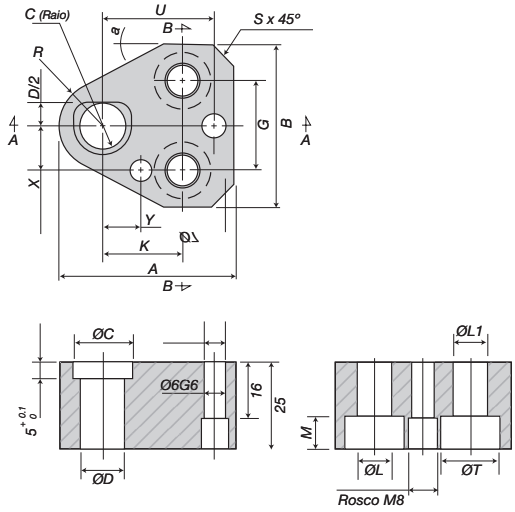
Catalog #	ØD	C	A	B	R	S	G	K	Y	U	X	L=L1	T	M	a°
MRR008	8	12.0	44.5	41	9.5	5.0	22.24	19.05	7.5	26.925	9.0	9	14.5	9	30º
MRR010	10	14.5	44.5	41	9.5	5.0	22.24	19.05	7.5	26.925	9.0	9	14.5	9	30º
MRR013	13	18.0	50.5	47	12.5	6.5	28.54	19.05	6.5	29.970	12.0	9	14.5	9	28º
MRR016	16	20.5	53.5	50	14.0	7.0	31.74	19.05	6.0	31.750	13.5	9	14.5	9	28º
MRR020	20	25.5	60.0	55	17.5	8.0	34.94	19.05	5.0	33.530	16.5	11	18.0	11	28º
MRR025	25	30.5	69.5	63	22.0	9.0	39.68	23.82	7.0	40.640	22.0	14	20.5	13	28º
MRR032	32	38.5	69.5	63	22.0	9.0	39.68	23.82	7.0	40.640	22.0	14	20.5	13	28º

Head Type Retainers - Shaped

Retainer Set Includes:
- 2 Screws
- 2 Dowels

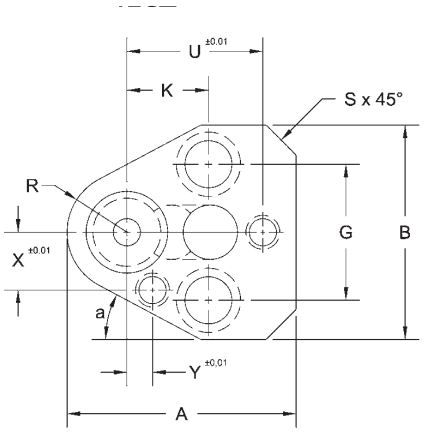
Material:
Retainer: SAE 4140/43-48 HRc.

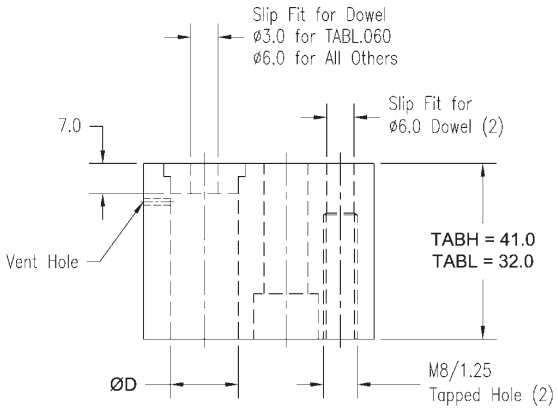
Catalog #:
MSR xxx



METRIC

Catalog #	ØD	C	A	B	R	S	G	K	Y	U	X	L=L1	T	M	a°
MSR008	8	6.0	44.5	41	9.5	5.0	22.24	19.05	7.5	26.925	9.0	9	14.5	9	30º
MSR010	10	7.3	44.5	41	9.5	5.0	22.24	19.05	7.5	26.925	9.0	9	14.5	9	30º
MSR013	13	9.0	50.5	47	12.5	6.5	28.54	19.05	6.5	29.970	12.0	9	14.5	9	28º
MSR016	16	10.3	53.5	50	14.0	7.0	31.74	19.05	6.0	31.750	13.5	9	14.5	9	28º
MSR020	20	12.8	60.0	55	17.5	8.0	34.94	19.05	5.0	33.530	16.5	11	18.0	11	28º
MSR025	25	15.3	69.5	63	22.0	9.0	39.68	23.82	7.0	40.640	22.0	14	20.5	13	28º
MSR032	32	19.3	69.5	63	22.0	9.0	39.68	23.82	7.0	40.640	22.0	14	20.5	13	28º





Retainer Set Includes:

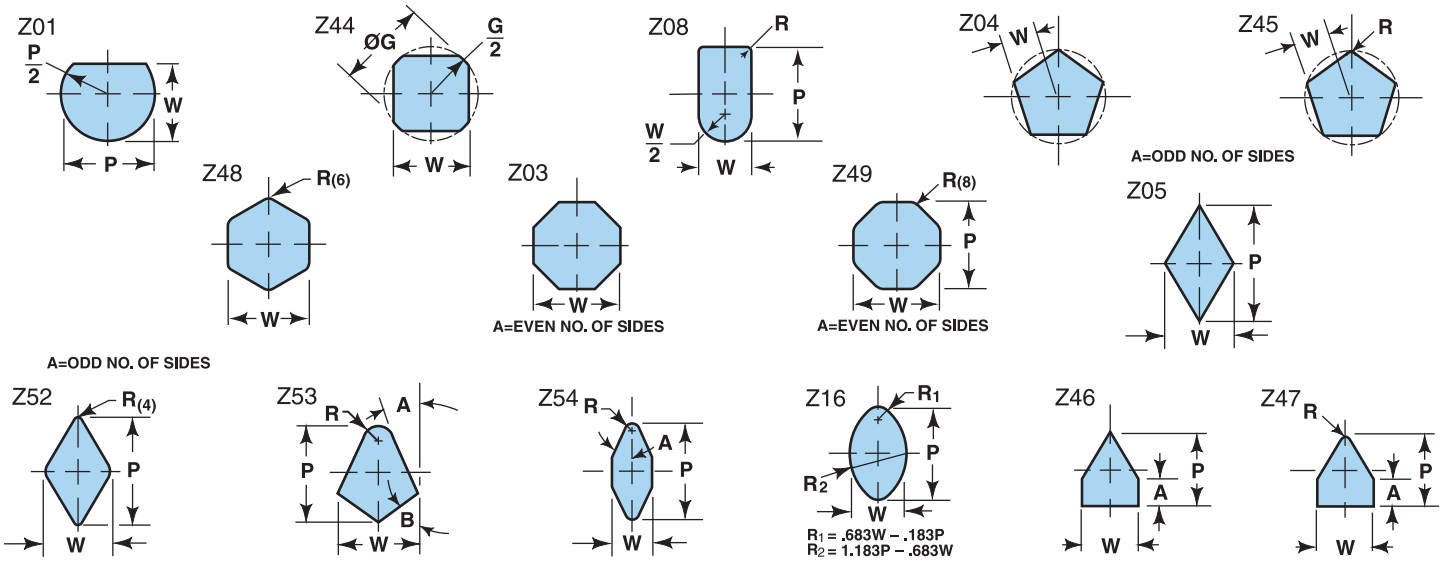
- 1 Ball
- 1 Spring
- 2 Screws
- 2 Dowels
- 1 Ball Release SHCS

Material:
Retainer: SAE 4140/43-48 HRc.
Backing Plug: SAE S1 / 50 - 54 HRc.

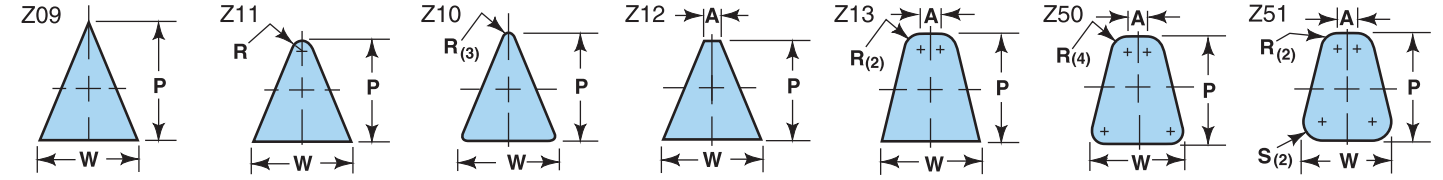
METRIC

Catalog Number	ØD	A	B	U	Y	K	G	X	R	S	a°	Screw Size
LIGHT DUTY												
MLR 006	6	35.0	37.5	23.000	9.0	19.0	22.00	8.0	8.0	5.0	30°	M6/1.00
MLR 010	10	44.3	41	26.925	7.5	19.05	22.24	9.0	9.5	5.0	30°	M8/1.25
MLR 013	13	50.4	47	29.970	6.5	19.05	28.54	12.0	12.5	6.0	28°	M8/1.25
MLR 016	16	53.5	50	31.750	6.0	19.05	31.74	13.5	14.0	7.0	28°	M8/1.25
MLR 020	20	60.1	55	33.530	5.0	19.05	34.94	16.5	17.5	8.0	28°	M10/1.50
MLR 025	25	69.7	63	40.640	7.0	23.82	39.68	22.0	22.0	9.0	28°	M12/1.75
MLR 032	32	69.7	63	40.640	7.0	23.82	39.68	22.0	22.0	9,0	28°	M12/1.75
HEAVY DUTY												
MHR 010	10	44.3	41	26.925	7.5	19.05	22.24	9.0	9.5	5.0	30°	M8/1.25
MHR 013	13	50.4	47	29.970	6.5	19.05	28.54	12.0	12.5	6.5	28°	M8/1.25
MHR 016	16	53.5	50	31.750	6.0	19.05	31.74	13.5	14.0	7.0	28°	M8/1.25
MHR 020	20	60.1	55	33.530	5.0	19.05	34.94	16.5	17.5	8.0	28°	M10/1.50
MHR 025	25	69.7	63	40.640	7.0	23.82	39.68	22.0	22.0	9.0	28°	M12/1.75
MHR 032	32	69.7	63	40.640	7.0	23.82	39.68	22.0	22.0	9.0	28°	M12/1.75
MHR 040	40	76.4	73	43.993	10.0	27.00	48.00	26.0	26.0	10.0	28°	M12/1.75

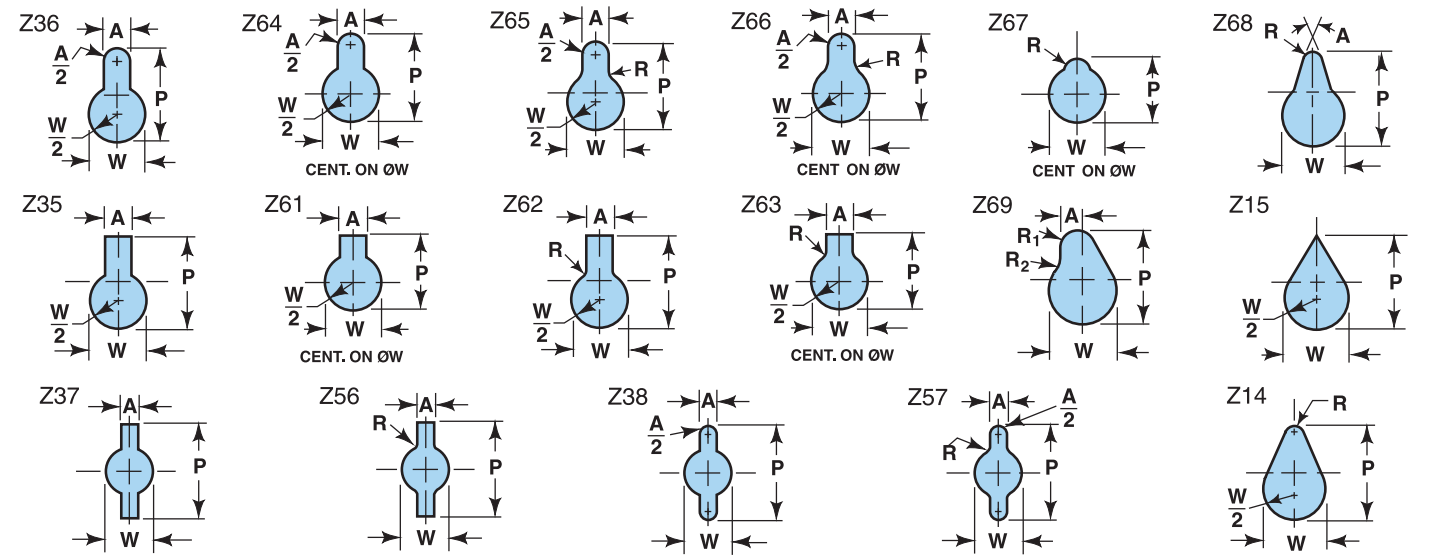
Forms



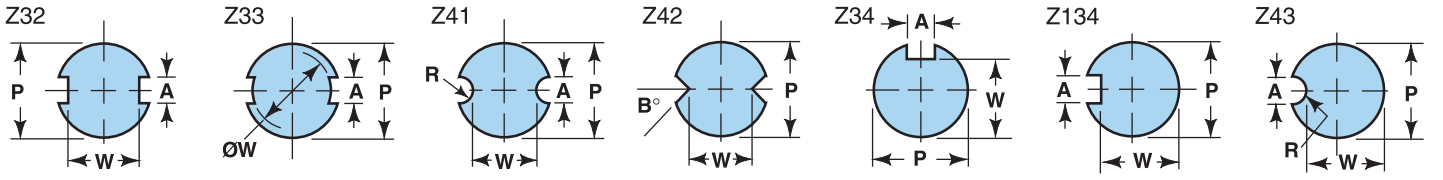
Triangles & Trapezoid Forms



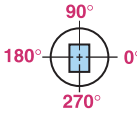
Keyhole & Teardrop Forms



Knock–Out Forms



In cases where clearance per side (∅) is .08 ∅or less we will break the sharp corners to eliminate interference, when punches, and/or guides and dies are ordered together.



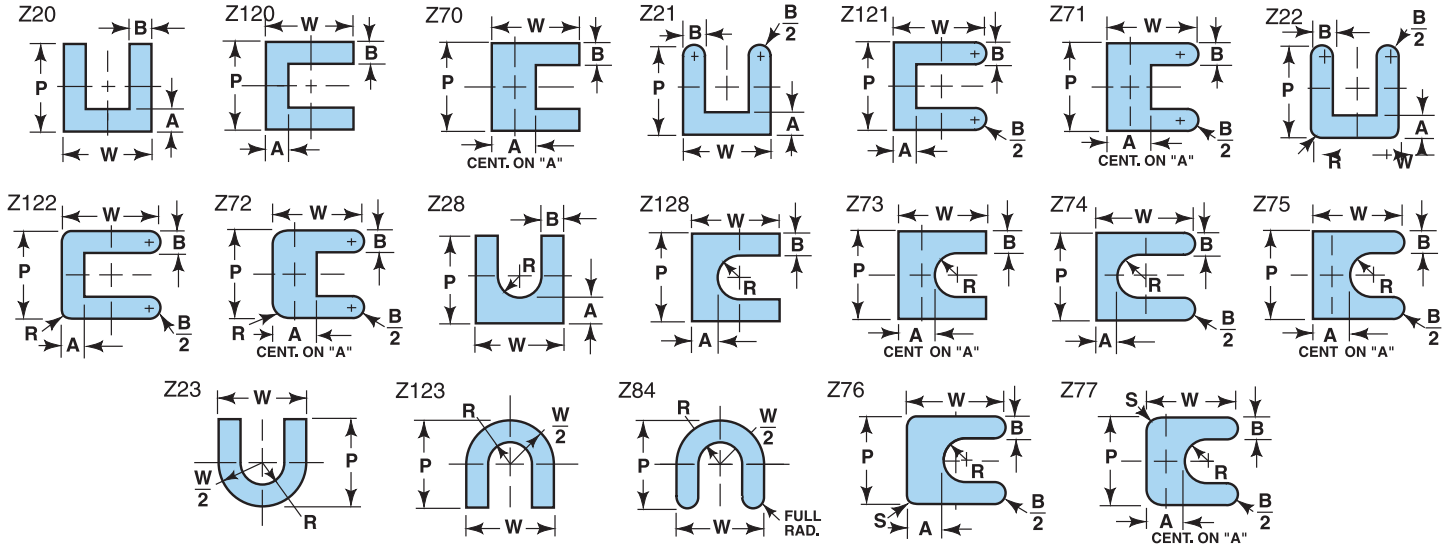
VIEWS: Shown as in-die position. This is reflected view for punch and guide, plan view (thru cutting end) of die button. *See page 39 for details.*

CENTERING: Forms are centered to the shank or body as shown. Exception being forms Z09 and Z15, will not be centered on P due to clearance.

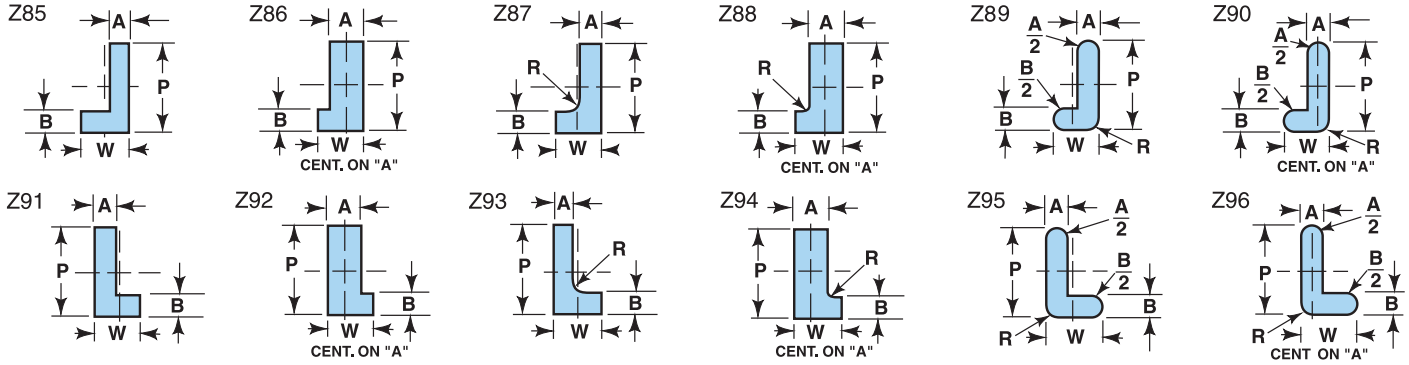
When Ordering Forms Specify:

Qty	Mat.	Type	Code	L_2/L	Form	P	W	R	Locate
5	M2	( ) Z	010	19/080	Z-06	P=6.0	W=4.0	1.0	LM1

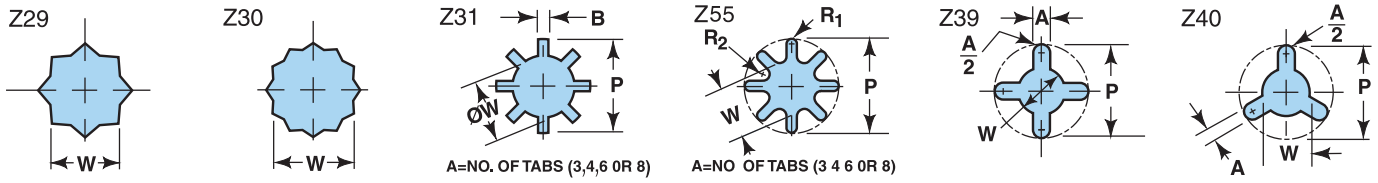
U Shape Forms



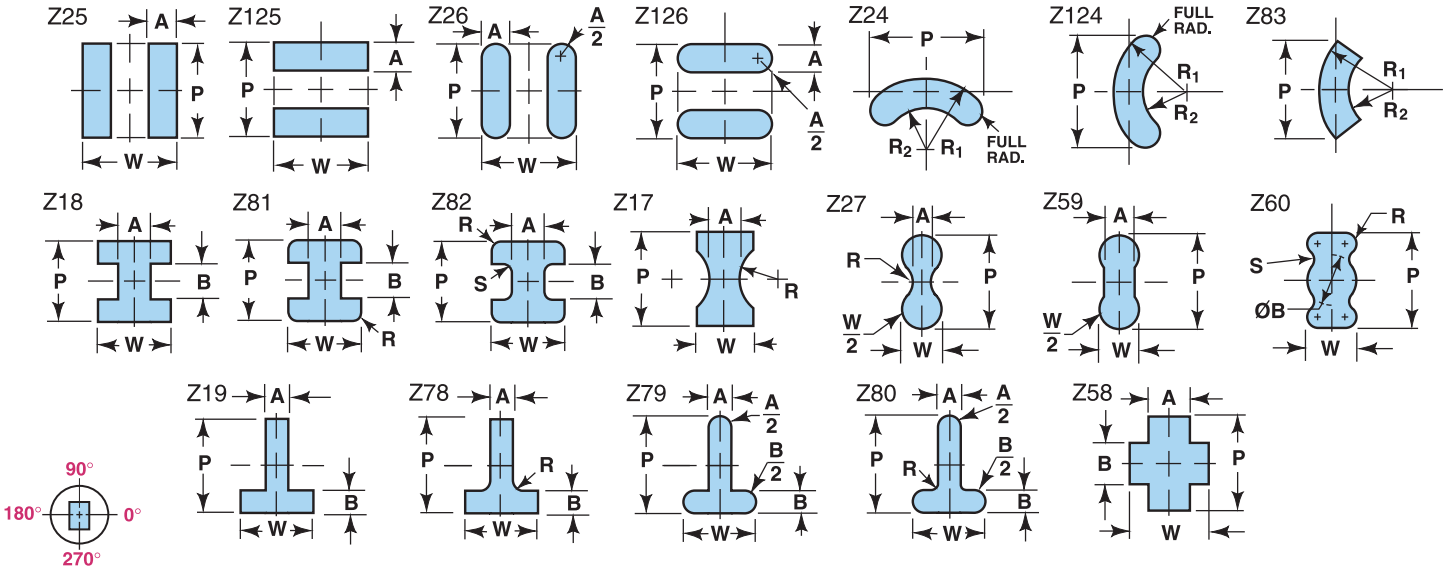
L Shape Forms



Spline Shape Forms

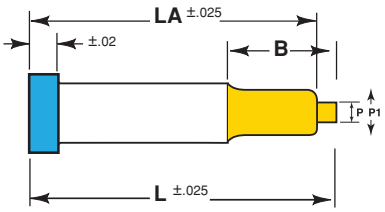


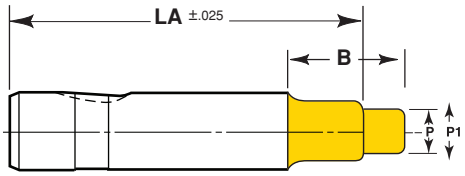
Knock–Out Forms

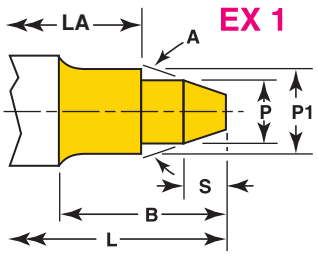


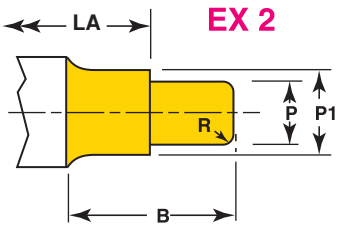
ORIENTATION: Bal-Lok Punch and Die Button Standard Ballseat location is at 90°. For all else standard flat and dowel location is at 0°. Alternate and custom locations are also available, see orientation guidelines.

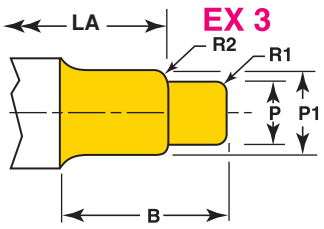
Standard Perforate & Extrude Tips

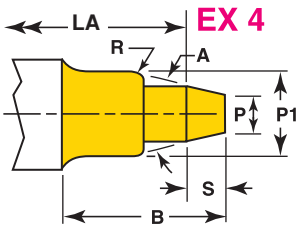


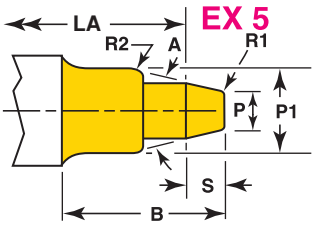


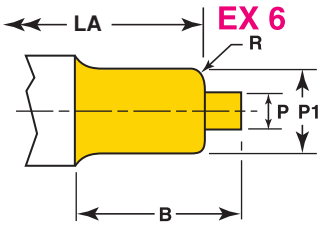


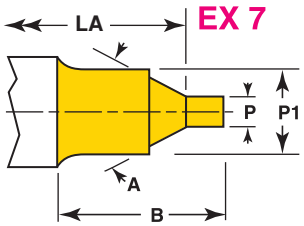


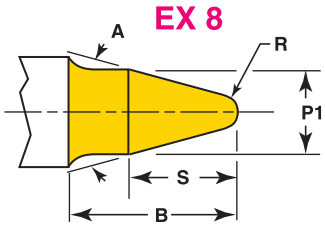


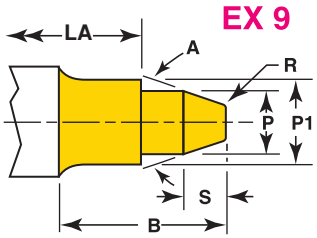


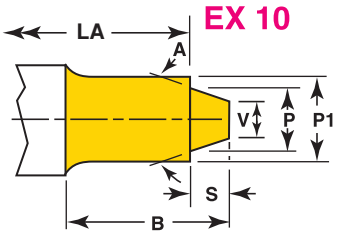


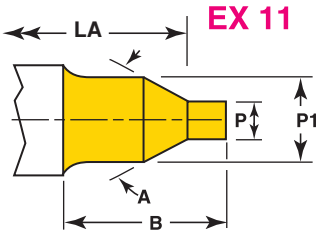


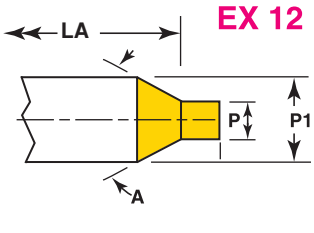


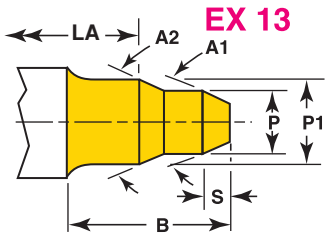


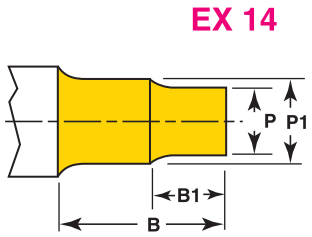


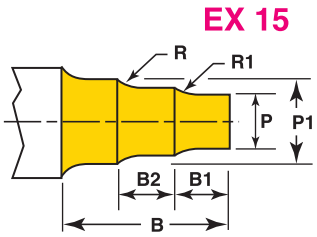


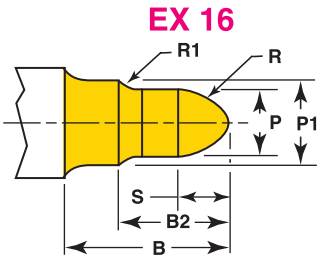


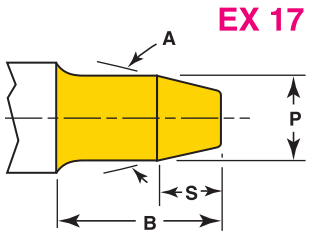


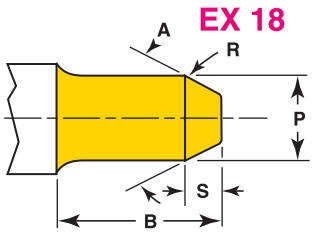


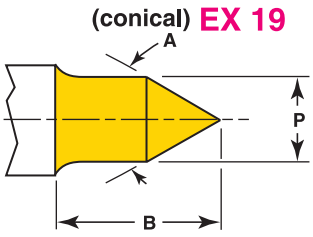


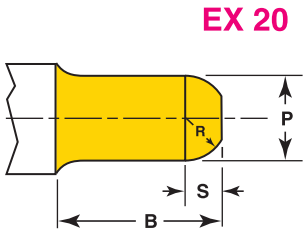








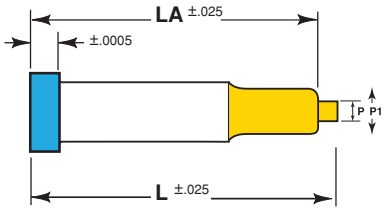




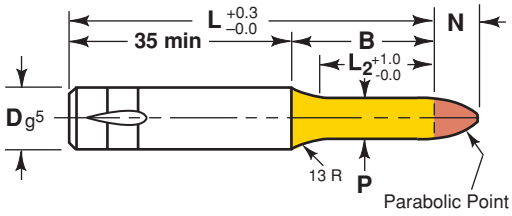
All shank to largest point diameter will be supplied with 13mm radius blend unless otherwise specified. All inside corners will be supplied with .5mm radius blend unless otherwise specified.

For **LA** information see panel on page 39.

Standard Perforate & Extrude Tips

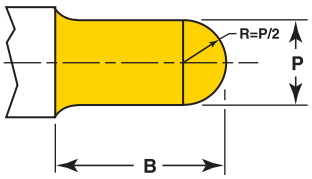


EX-LP

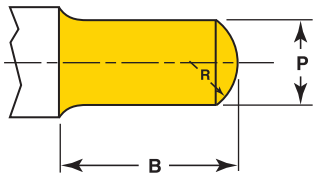


B & L Lengths do not include Pilot Tip N

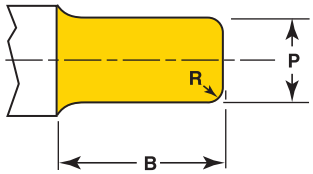
(ball) EX 21



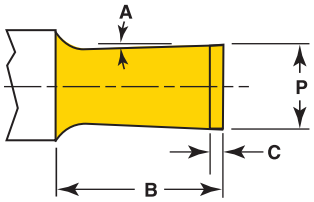
EX 22



EX 23



EX 24

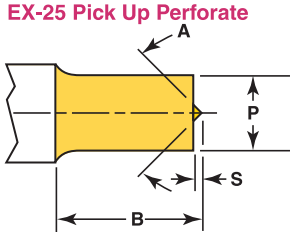


All shank to largest point diameter will be supplied with 13mm radius blend unless otherwise specified. All inside corners will be supplied with 15mm radius blend unless otherwise specified.

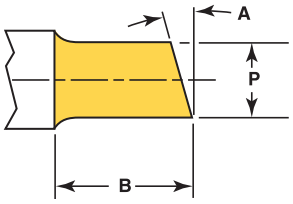
For **X** information see panel on page 39.

Standard Punch Shear

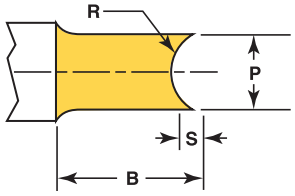
EX-25 Pick Up Perforate



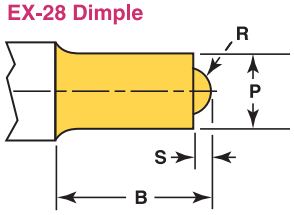
EX-26 Angle Shear



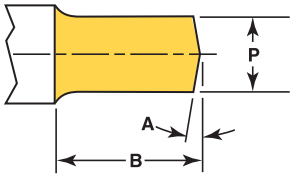
EX-27



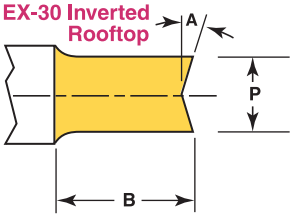
EX-28 Dimple



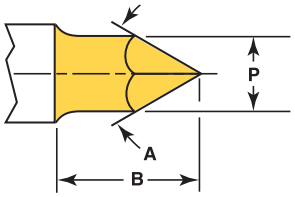
EX-29 Rooftop



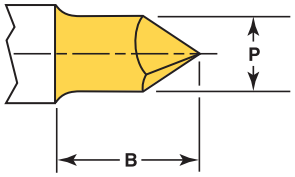
EX-30 Inverted Rooftop



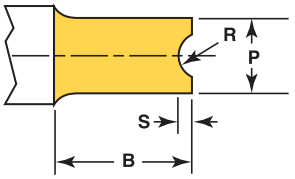
EX-31 Nail Point 4 Sided



EX-32 Nail Point 3 Sided



EX-33

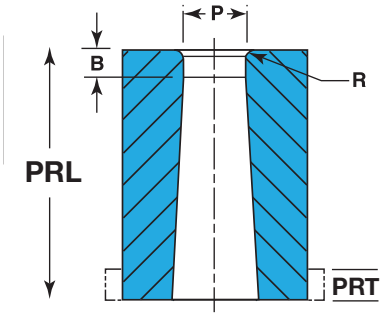


Ex. 1 thru **Ex. 33** tips are available on all standard catalog range punches. (Head type, Headless and Bal-Lok Solid and Retrakto.)

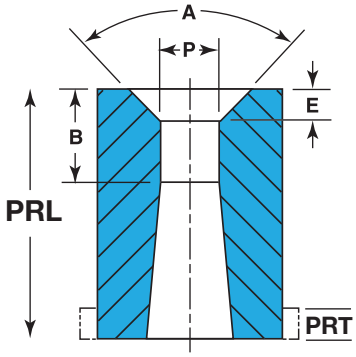
Use caution when using Retrakto type in relation to point length (P) and smallest point Ø (P). Some tips are not compatible with Retrakto use. **(Example # Ex. 31)**

When no **B** (point length) is called out, the standard **B** for the type punch selected will be supplied. All Ultra Precision style must call out **B** length as there are more than one standard available for this style punch.

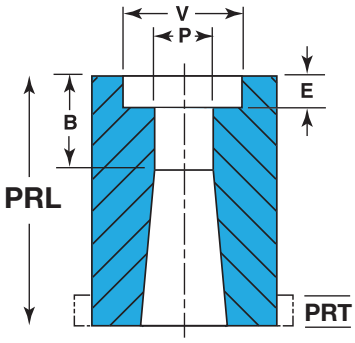
Common type of extrusion punches are shown above and can be configured on any style punch as called out by the customer. Configurations of other styles can be furnished upon receipt of customer drawings with specified tolerances.



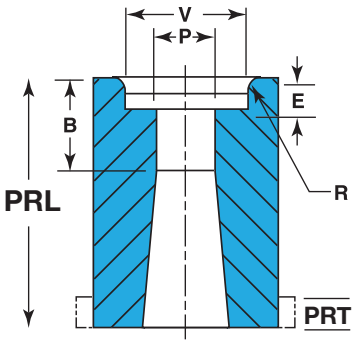
EX-40



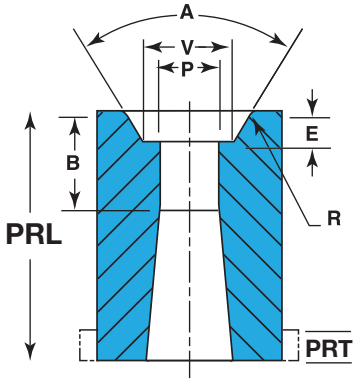
EX-41



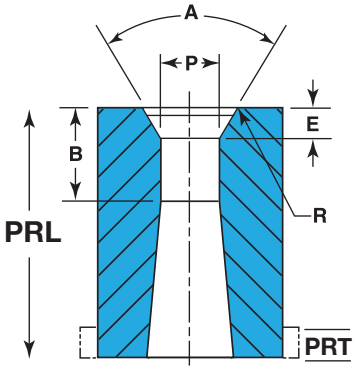
EX-42



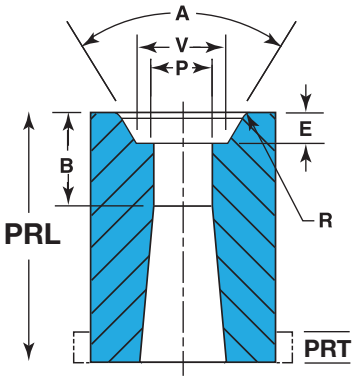
EX-43



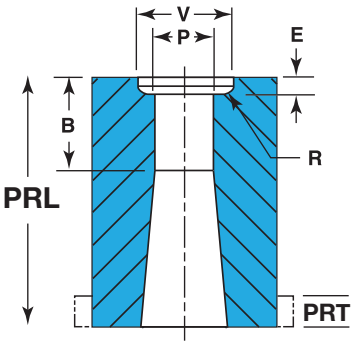
EX-44



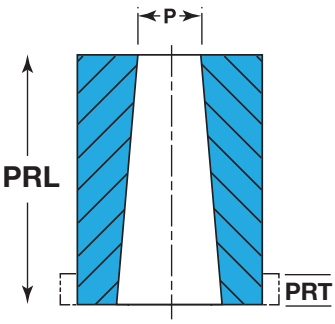
EX-45



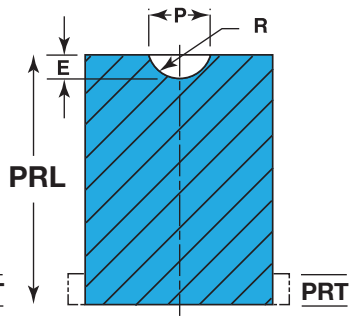
EX-46



EX-47



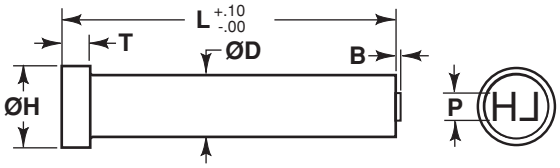
EX-48



EX-49

Standard materials used on any of these will be M2 with RC of 60-63 unless called out by the customer to be otherwise. Other configurations can be manufactured with drawings submitted by the customer.

Marking Punches and Custom Stamps

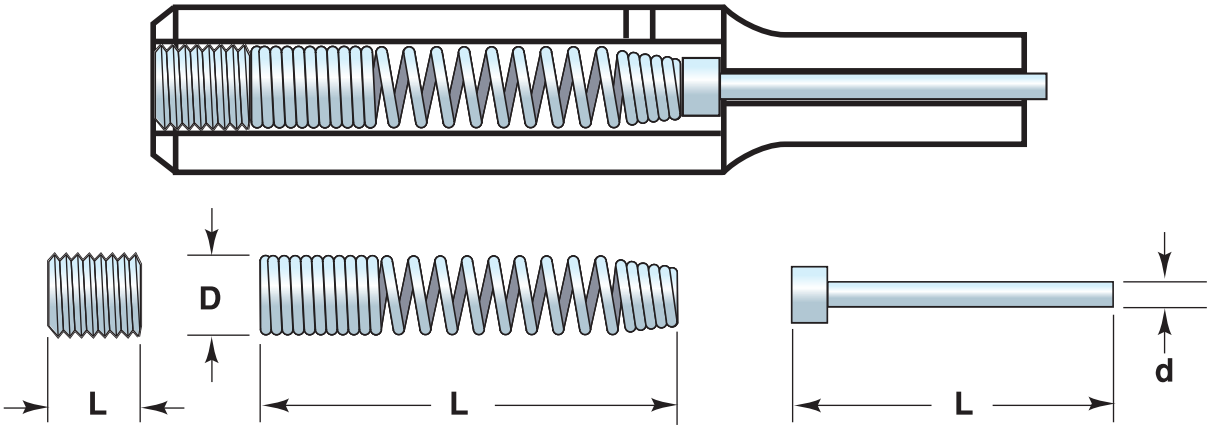


Many custom stamps and marking punches are available from Porter. Please identify punch style as part of the order. All tolerances on punch body other than (L) will be manufactured to catalog standards unless otherwise specified by the customer.

Ordering Example (Specify punch style) Drawings Required

Qty	Steel	Type	Code	L		P	B
12	M-2	( )MP	50	x	80	P=10.00	3.00

Metric Ejector Replacement Components



Replacement Ejector Kit	Punch Type		Set Screw	Spring			Pin			Pin Extension Length
	Headed	HD Bol-bk	Size/Length	Hole-D	D	L	Hole	L	d	
K2M	5		2.5 x 4.0	2.20	2.10	50	.50	28	.43	.8
K3M	6	10	3.0 x 3.0	2.52	2.40	63	.80	35	.68	.8
K4M	8	10	4.0 x 4.0	3.52	3.30	73	1.16	49	1.04	1.6
K6M	10-13	13-16	5.0 x 5.0	4.42	4.30	73	1.59	49	1.47	1.6
K9M	16-20-25	20-25	6.0 x 6.0	5.52	5.00	80	2.38	56.5	2.26	1.6
K12M	32 &>	32 &>	8.0 x 8.0	7.12	7.00	80	3.17	56.5	3.05	1.6

Kit includes 1 each – set screw
– spring
– pin
Components available as kits or separately.

Ejector Springs and pins are cut to length at assembly.

Metric Standard Alterations

Alterations beyond standard ranges listed in the catalog that can be accomplished for a slight additional charge.Alterations beyond those listed consult factory.
Standard catalog tolerances are used for all alterations unless otherwise specified

RL = Reduce Length (L)
- Punches- Stock is removed from the point end, also reducing the point length (B)
- Die Buttons-Headless (Excluding Bal-Lok). Stock is removed from the Co-bore end. Head Type with Co-Bore relief. Stock is removed from the I.D. end shortening the (B).
- Taper dies "RL" will not reduce land length

RLB = Reduce length maintain "L_2"

PRL = Precision Reduced Length
- Same as "RL" plus "L" is held to ±.02

RD = Reduced Diameter of Shank or Body
- Max standard reduction 1.0 (Further reduction consult factory). "H" remains the same.

RP = Reduce "P" on Round Punches
- (See chart for standard ranges or consult factory)

RW = Reduce "W" on Shape Punches
- (See chart for standard ranges or consult factory)

RT = Reduce Head Thickness
- Stock removed from the top of the head (Reduces "L")

PRT = Precision Reduced Head Thickness
- Same as RT. "T" is held to $^{+.02}_{-.00}$

RH = Reduce Head Diameter
- Max standard reduction 1mm (Further reduction consult factory)

LPC = Longer Point Circular
- Solid Punches Only
- Specify "B" length up to 44 mm
- Minimum body Length shown in catalog (Further reduction consult factory)

LPW = Longer Point Shape
- Solid Punches Only
- Specify "B" length up to 44 mm
- Minimum body length shown in catalog (Further reduction consult factory)

AP = Alter "P" on Round Dies
- Standard dies up to .5 over listed range (Greater increases require "AR")
- Taper dies (See chart)

AW =Alter "W" on Shape Dies
- Standard dies up to .5 over listed range (Greater increases require "AR")
- Taper dies (See chart)

AR = Alter Relief on Co-Bore Dies
- Round Relief Only

AB = Alter Land "B" Length on Die Buttons
- Reduction is from I.D. end shortening "L"

IB = Increase Land "B" on Die Buttons
- Taper Dies {1.3-6.0 (6.0) max}
- {P or W 6.1 and over (13.0) max} [Longer consult factory]
- Co-Bore Dies (Consult factory)

SK = Slug Keeper
- Slug Retention System

AT = Alter Taper

RP-Reduce P Chart

BODY CODE	PRC RC HEC XRC CDRC	PC SC HC XSC CDSC	PLP PP PAP SLP SAP SP CDSAP	HBRC	BRC	BC HBC	HBLP HBAP HBP BLP BAP BP
004		1.30					
005	1.30	1.60	1.60				
006	2.00	2.00	1.60		1.30	1.30	1.40
008	3.00	3.00	1.60				
010	4.00	4.00	1.60	1.80	1.80	1.60	1.60
013	4.00	4.00	3.20	4.00	4.00	4.00	4.00
016	6.00	6.00	6.00	4.00	4.00	4.00	4.00
020	6.00	6.00	6.00	6.00	6.00	6.00	6.00
022	6.00	6.00	6.00				
025	8.00	8.00	8.00	8.00	8.00	8.00	8.00
032	10.00	10.00	10.00	10.00	10.00	10.00	10.00
040	13.00	13.00		12.00	12.00	12.00	12.00

Below 1.60mm L2 = 8 max. Pilots L2 = 10 max.
Below 2.50mm L2 = 19 max. Pilots L2 = 121 max.

RW-Reduce W Chart

BODY CODE	PRO PRR PRS PRF CDRO CDRR CDRS CDRF	PO PR PO PF CDSO CDSR CDSS CDSF	RO RR RS RF XRO XRR XRS XRF	SO SR SS SF XSO XSR XSS XSF	HBRO HBRR HBRS HBRF	HBO HBR HBS HBF	BRO BRR BRS BRF	BO BR BS BF
004		1.06		1.60				
005	1.60	1.60	1.60	1.60				
006	2.00	2.00	2.00	2.00			1.80	1.80
008	3.00	3.00	3.00	3.00				
010	4.00	4.00	4.00	4.00	1.80	1.80	1.80	1.80
013	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
016	6.00	6.00	6.00	6.00	4.00	4.00	4.00	4.00
020	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
022	6.00	6.00	6.00	6.00				
025	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
032	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20
040	7.20	7.20	7.20	7.20	7.20	7.20		

Below 1.50mm L2 = 13 max. Below 2.30mm L2 = 19 max.

AP-Alter P Chart

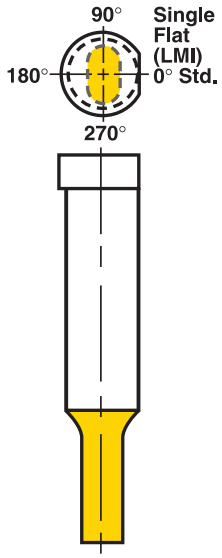
Inch Body Ø	MaxP/W/G
5.0	3.2
6.0	4.0
8.0	6.2
10.0	7.7
13.0	10.4
16.0	12.8
20.0	16.0
25.0	20.0
32.0	25.6
38.0	30.0
40.0	32.0

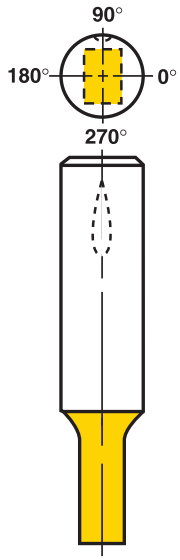
AR-Alter RØ Chart

Inch Body Ø	MaxP/W/G
8.0	6.6
10.0	8.1
13.0	10.8
16.0	13.3
20.0	16.8
25.0	20.8
32.0	26.4
38.0	30.8
40.0	32.8

VIEWS

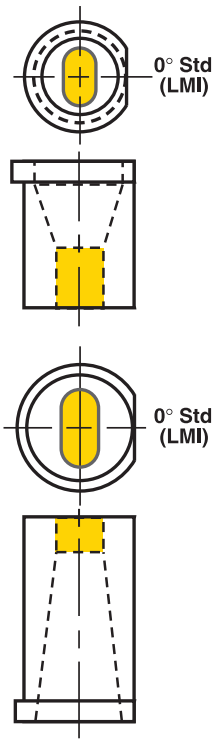
All views are shown as in die position view. This is the reflected (thru shank) view for the punch and guide, and is the plain view (thru I.D. end) for the die button (matrix). This view is consistent whether for headed and press fit items or Bal-Lok items.

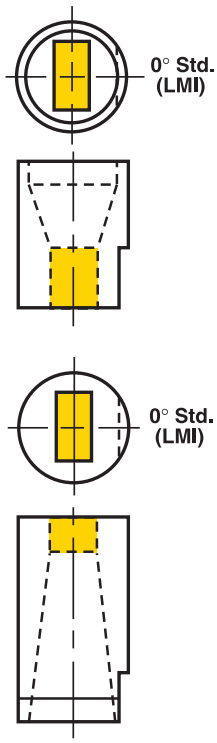




ORIENTATION

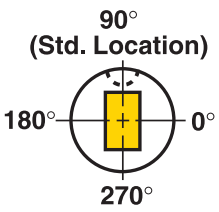
On Headed and Press Fit punches, die buttons and guide bushings the standard keying location is at 0° (on the long side of the standard shape). Custom locations are available and called out as the number of degrees counter clockwise from 0° **(Example: LM1@45°)**

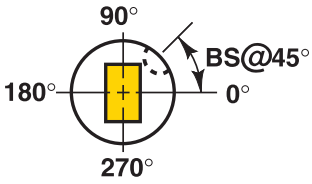




BAL-LOK Punches and Die Buttons.

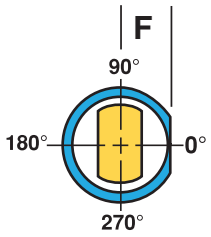
The standard ball-seat keying location is at 90°, (in the end zone if looking at a football field). Custom locations are available and called out as the number of degrees counter clockwise from 0°. **(Example: BS@45°)**



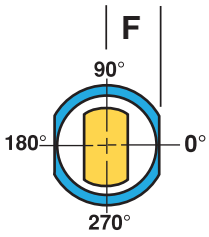


Locating Methods, Punches, Dies & Guide Bushings

LM1



LM2



TOLERANCES

Standard Precision F= $^{+0.02}_{-0.00}$ to C/L

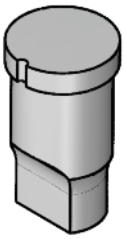
.001/1.000 Parallel

Ultra Precision F= $^{+0.01}_{-0.00}$ to C/L

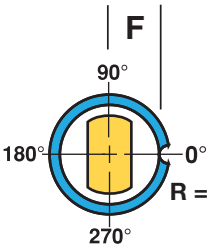
0.05/100 Parallel

Flat length $^{+.25}_{-.00}$

LM3



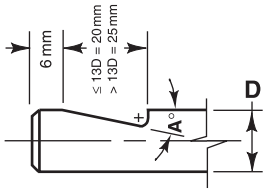
LM3



R = 1.5 (F = .5D)

Standard Locating Methods		
Flat		**Depth**
LM1	F =	.5D
LM2	F =	.5D

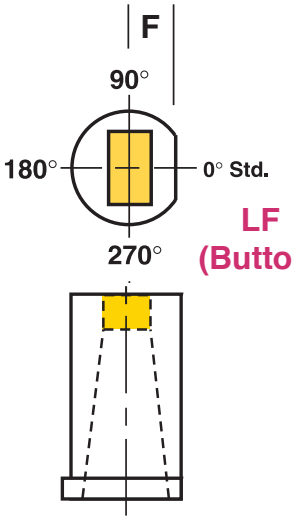
All above locating methods are supplied at standard location (0°) "Alternate locations are available at no extra charge"Call out (LM1@90)



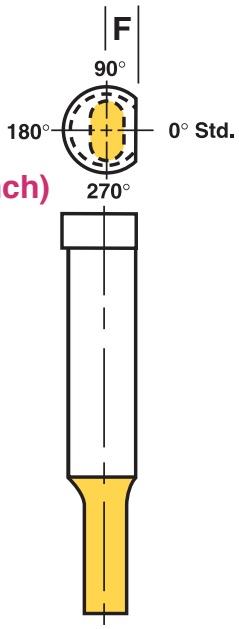
For Shape and Form Headless Punches
Specify LM7 relation to shape.
Standard location is at 0°
Alternate angles are available
Specify LM7 A=12°.

STD LM-7	
D	**A°**
≤10mm	5°
13mm	7.5°
≥16mm	10°

Full Body Flat-Headed Punches & Die Buttons



LF (Button)

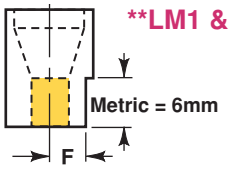


LF (Punch)

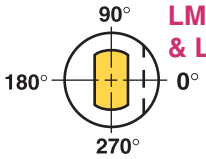
Full Length Die Button		
LF1A	F=	.5D-1.0
LF1	F=	.5D-1.5
LF11	F=	.5D-2.5
LF12	F=	Specify

Full Length Punch Flats		
LF2A	F=	.5D-1.0
LF2	F=	.5D-1.5
LF21	F=	.5D-2.5
LF22	F=	Specify

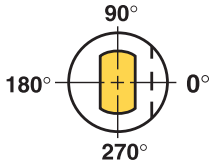
Flat Locations-Headless Die Buttons & Guide Bushings

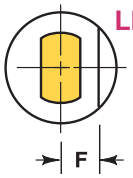


**LM1 & LM41

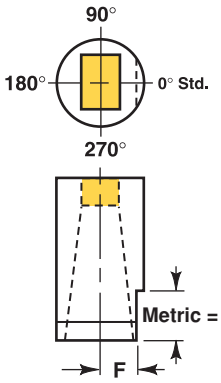


LM1, LM41 & LM42





LM20



Call Out		D*	Body Diameter "D"													
			05	.06	08	10	13	16	20	22	25	32	38	40	45	50
LM1	6	F =	.5D – 1.5 mm													
LM2	6	F =	.5D – 1.5 mm													
LM20	14	F =			3.5	4.0	5.5	7.0	8.5	9.5	11.0	14.0	17.0	18.0	20.5	23.0
LM41①	6	F =	2.2	2.6	3.5	4.3	5.6	6.9	8.7	9.5	10.8	13.8	16.5	17.4	19.5	21.7
LM42②	6	F =	2.0	2.5	3.5	4.0	5.5	7.0	8.5	9.5	11.0	14.0	17.0	18.0	20.5	23.0

*Additional variations available (consult factory or supply drawings of requirement)
**Above flats available on Cutting end at no charge (Example LM1C) ① Old style standard ② New standard

TOLERANCES ON ALL FLATS

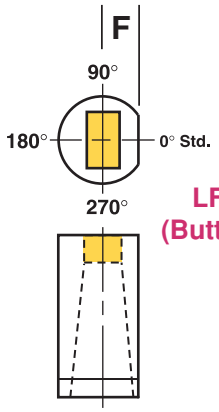
Standard Precision F= $^{+0.02}_{-0.00}$ to C/L

.001/1.000 Parallel

Ultra Precision F= $^{+0.01}_{-0.00}$ to C/L

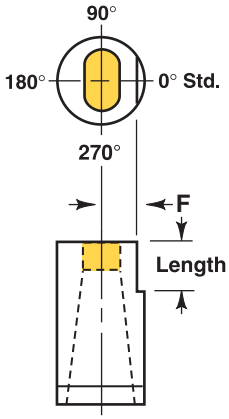
0.05/100 Parallel

Flat length $^{+.25}_{-.00}$



LF- (Button)

Full Length Die Button		
LF1A	F=	.5D-1.0
LF1	F=	.5D-1.5
LF11	F=	.5D-2.5
LF12	F=	Specify

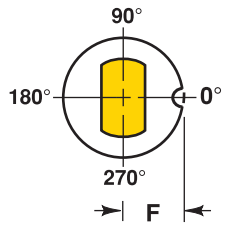


LM43, LM44, LM45, LM46, LM47, LM48, LM49, LM 80
(Flat is on cutting–End)

Call Out	F	Length
LM43	.5D-1.5	13
LM44	.5D-1.5	16
LM45	.5D-1.5	20
LM46	SPECIFY	
LM47	.5D-2.5	13
LM48	.5D-2.5	16
LM49	.5D-2.5	20
LM80	.5D-2.5	14

D*	Body Diameter "D"											
	08	10	13	16	20	22	25	32	38	40	45	50
F =	3.5	4.0	5.5	7.0	8.5	9.5	11.0	14.0	17.0	18.0	20.5	23.0

Dowel Slots - Dies



LM (6, 63, 64, 65, 66)

Metric = 3.0 Ø Dowel

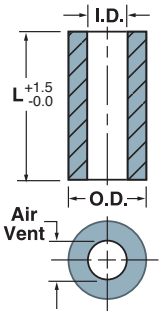
Headless Die Button Guide Bushing

Call Out	Dowel Ø	D=	Body Diameter "D"									
			05	06	08	10	13	16	20	22	25	32 & up
LM6	3 mm	F =	.5D	.5D	.5D	.5D	.5D	.5D	.5D	.5D	.5D	.5D
LM63	3 mm	F =	3.5	3.9	4.7	5.5	6.7	.5D	.5D	.5D	.5D	.5D
LM64	4 mm	F =	4.0	4.4	5.2	6.0	7.2	.5D	.5D	.5D	.5D	.5D
LM65①	4 mm	F =	3.5	4.0	5.0	6.0	7.5	.5D	.5D	.5D	.5D	.5D
LM66②	6 mm	F =	–	–	6.2	7.0	8.2	9.0	11.0	12.0	13.5	.5D

Custom locations (other than 0°, 90°, 180° and 270°) ① Old style standard ② New standard
LM8= Dowel Slot Custom Location (LM8@45)

Urethane Punch Strippers

Durathane
Open End Punch Strippers



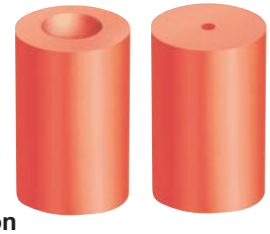
All are oil and solvent resistant 95A durometer. All provide greater pressures than equal sized steel die springs. All are easy to install and dampen vibration. Pop-On's closed end gives more positive stripping and full stripping around periphery of punch point. Open end more economical.

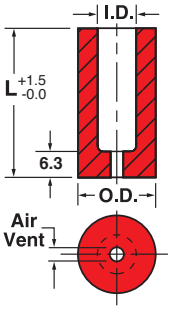
Ordering Example:

Quantity	Description
6	05-45

I.D. mm	O.D. mm	Length L mm	Catalog Number	Approx. Stripping Pressure in kg at deflection of 4 mm	7 mm	10 mm
5	18	35	O05-35	125 kg	200 kg	
		45	O05-45	115 kg	175 kg	
		55	O05-55	105 kg	150 kg	
6	19	35	O06-35	140 kg	240 kg	
		45	O06-45	135 kg	230 kg	
		55	O06-55	110 kg	190 kg	240 kg
		65	O06-65	90 kg	130 kg	200 kg
8	21	35	O08-35	160 kg	250 kg	
		45	O08-45	150 kg	225 kg	
		55	O08-55	135 kg	200 kg	
		65	O08-65	120 kg	185 kg	290 kg
		71	O08-71	100 kg	165 kg	270 kg
10	23	35	O10-35	210 kg	350 kg	
		38	O10-38	190 kg	310 kg	
		45	O10-45	175 kg	285 kg	
		47	O10-47	160 kg	270 kg	
		55	O10-55	145 kg	250 kg	325 kg
		65	O10-65	130 kg	220 kg	290 kg
		71	O10-71	115 kg	190 kg	265 kg
13	26	35	O13-35	260 kg	390 kg	
		38	O13-38	225 kg	360 kg	
		45	O13-45	215 kg	340 kg	
		47	O13-47	165 kg	270 kg	
		55	O13-55	150 kg	240 kg	300 kg
		65	O13-65	130 kg	200 kg	250 kg
		71	O13-71	105 kg	160 kg	200 kg
16	30	35	O16-35	300 kg	460 kg	
		38	O16-38	260 kg	420 kg	
		45	O16-45	240 kg	390 kg	
		47	O16-47	235 kg	385 kg	
		55	O16-55	220 kg	360 kg	460 kg
		65	O16-65	200 kg	330 kg	420 kg
		71	O16-71	170 kg	290 kg	360 kg
20	38	38	O20-38	280 kg	420 kg	
		47	O20-47	240 kg	390 kg	
		55	O20-55	200 kg	350 kg	550 kg
		65	O20-65	165 kg	300 kg	450 kg
		71	O20-71	150 kg	270 kg	400 kg
25	50	35	O25-35	1200 kg	1800 kg	
		38	O25-38	1100 kg	1600 kg	
		45	O25-45	1000 kg	1500 kg	
		47	O25-47	900 kg	1400 kg	
		55	O25-55	700 kg	1150 kg	1650 kg
		65	O25-65	600 kg	1000 kg	1450 kg
		71	O25-71	500 kg	850 kg	1300 kg

Pop-On
Closed End Punch Strippers

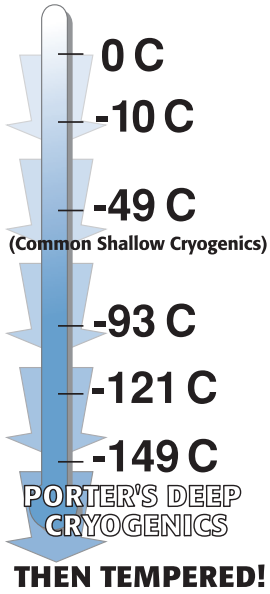




Ordering Example:

Quantity	Description
7	M6-45

I.D. mm	O.D. mm	Length L mm	Catalog Number	Approx. Stripping Pressure in kg at deflection of 3 mm	6.5 mm	9.5 mm
5	18	35	M05-35	125 kg	200 kg	
		45	M05-45	115 kg	175 kg	
		55	M05-55	105 kg	150 kg	
6	19	35	M06-35	140 kg	240 kg	
		45	M06-45	135 kg	230 kg	
		55	M06-55	110 kg	190 kg	240 kg
		65	M06-65	90 kg	130 kg	200 kg
8	21	35	M08-35	160 kg	250 kg	
		45	M08-45	150 kg	225 kg	
		55	M08-55	135 kg	200 kg	
		65	M08-65	120 kg	185 kg	290 kg
		71	M08-71	100 kg	165 kg	270 kg
10	23	35	M10-35	210 kg	350 kg	
		38	M10-38	190 kg	310 kg	
		45	M10-45	175 kg	285 kg	
		47	M10-47	160 kg	270 kg	
		55	M10-55	145 kg	250 kg	325 kg
		65	M10-65	130 kg	220 kg	290 kg
		71	M10-71	115 kg	190 kg	265 kg
13	26	35	M13-35	260 kg	390 kg	
		38	M13-38	225 kg	360 kg	
		45	M13-45	215 kg	340 kg	
		47	M13-47	165 kg	270 kg	
		55	M13-55	150 kg	240 kg	300 kg
		65	M13-65	130 kg	200 kg	250 kg
		71	M13-71	105 kg	160 kg	200 kg
16	30	35	M16-35	300 kg	460 kg	
		38	M16-38	260 kg	420 kg	
		45	M16-45	240 kg	390 kg	
		47	M16-47	235 kg	385 kg	
		55	M16-55	220 kg	360 kg	460 kg
		65	M16-65	200 kg	330 kg	420 kg
		71	M16-71	170 kg	290 kg	360 kg
20	38	38	M20-38	280 kg	420 kg	
		47	M20-47	240 kg	390 kg	
		55	M20-55	200 kg	350 kg	550 kg
		65	M20-65	165 kg	300 kg	450 kg
		71	M20-71	150 kg	270 kg	400 kg
25	50	35	M25-35	1200 kg	1800 kg	
		38	M25-38	1100 kg	1600 kg	
		45	M25-45	1000 kg	1500 kg	
		47	M25-47	900 kg	1400 kg	
		55	M25-55	700 kg	1150 kg	1650 kg
		65	M25-65	600 kg	1000 kg	1450 kg
		71	M25-71	500 kg	850 kg	1300 kg



The Benefits

CRYOGENICS process forms very fine carbide particles throughout the material and increases wear resistance.

CRYOGENICS treatment results in a tougher substrate further increasing part life through reduced impact failures.

CRYOGENICS reduces internal stresses or completely eliminates part movement during the machining process.

CRYOGENICS requires only one treatment as it is a through part molecular change and not a surface layer. The results last the life of the tool. Sharpening will NOT eliminate the benefits.

CRYOGENICS is an exclusive combination of deep cryogenics (149C) treatment plus an additional temper during the heat- treating process. This results in internally altering the entire structure of the steel creating a dense and uniform molecular structure. CRYOGENICS is not a surface treatment! CRYOGENICS increases internal bonding while releasing internal stresses created by previous machining processes. Computer-controlled gradual cooling and warming cycles eliminate the possibility of thermal shock and prevent parts from becoming brittle.

Tin
Titanium Nitride

A (PVD) process of placing a thin coating of Titanium Nitride 1-5 microns thick over the working area of the punch.

Benefits

*Surface hardness of 2300 Vickers
*Dry coefficent of friction versus steel .4
*Thermal stability up to 600 C
* Appears gold in color

TIALN
Titanium Aluminum Nitride

A (PVD) process of placing a thin coating of Titanium Aluminum Nitride 2-5 microns thick over the working area of the punch.

Benefits

*Surface hardness of 3000 Vickers
*Dry coefficent of friction versus steel .6
*Thermal stability up to 700 C
*Appears grey

TICN
Titanium Carbonitrite

A (PVD) process of placing a thin coating of Titanium Nitride 1-5 microns thick over the working area of the punch.

Benefits

*Surface hardness of 3000 Vickers harder than Carbide"
*Dry coefficent of friction versus steel .3
*Thermal stability up to 400 C
*More wear resistance than TIN Appears brown or light blue.

P-41

A (PVD) process of placing a thin coating 1-8 microns thick over the working area of the punch.

Benefits

* Surface hardness of 2000-2800 Vickers
* Dry coefficient of friction versus steel .1
* Thermal stability up to 300 C
* More wear resistant than TICN
* Specially for non ferrous materials
* Appears black

Porter Plus (PPC)

A (PVD) process of placing a thin layer of this special coating (2-5 microns thick) over the working area of the punch.

Benefits

* Surface hardness of 3200 Vickers
* Dry coefficient of friction versus steel .35
* Thermal stability up to 1100 C
* More wear resistant than TICN
* Appears blue-grey

P-90

A (PVD) process of placing a thin coating 6-8 microns thick over the working area of the punch.

Benefits

* Surface hardness of 3800 Vickers
* Dry coefficient of friction versus steel .12
* Thermal stability up to 400 C
* More wear resistant coating
* Appears silver-grey

PZRN

A (PVD) process of placing a thin coating 2-10 microns thick over the working area of the punch.

Benefits

* Surface hardness of 2800 Vickers
* Dry coefficient of friction versus steel .5
* Specially for non-ferrous materials
* Appears yellow-gold

TICNMP

A (PVD) process of placing a thin coating 2-4 microns thick over the working area of the punch.

Benefits

* Surface hardness of 3000 Vickers
* Dry coefficient of friction versus steel .2
* Specially for Galling issues in steel
* Appears bronze

CRN

A (PVD) process of placing a thin coating 2-4 microns thick over the working area of the punch.

Benefits

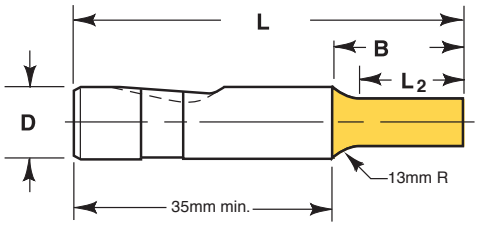
* Surface hardness of 2300 Vickers
* Dry coefficient of friction versus steel .3
* Specially for forming punches
* Appears silver

Blank Punch Sketch Tool

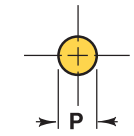
2734 Banning Road
Cincinnati, OH 45253-8706
Ph: (513) 923-3777
Fax: (513) 923-1111

PORTER PRECISION PRODUCTS
Blank Punch Sketch Tool
Porter@PorterPunch.com or Georgia@PorterPunch.com

660 James Road
Alpharetta, GA 30004
Ph: (770) 751-7234
Fax: (770) 751-7238



☐ HD B/L
☐ LD B/L
☐ Ejector



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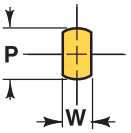

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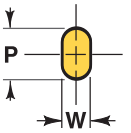

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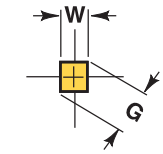

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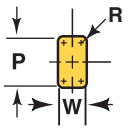

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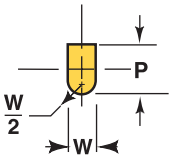

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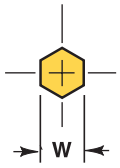

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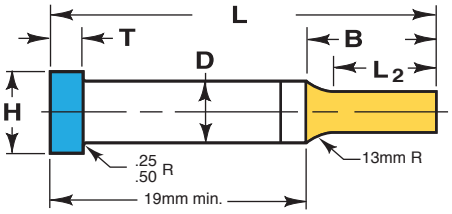
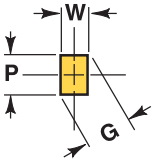


☐ Ejector



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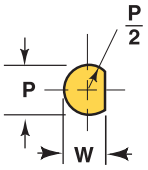

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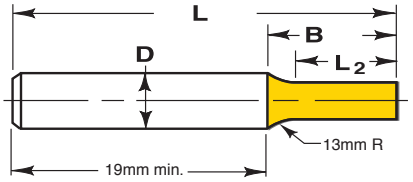
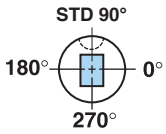
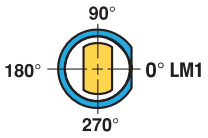


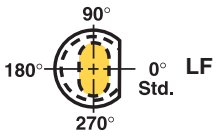
☐ Ejector

Locating Devices



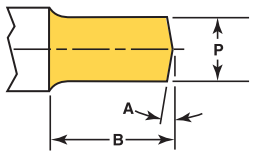
Punches use Reflective View





Nose Point Alteration

EX-29 Rooftop



*All tolerances will be held to industry standards unless otherwise specified

Company Name	Tool #	Part #/ Det #	Description (Porter Precision Products)			
Body Dia "D"	Length "L"	Material	Nose Length "B" or L2	Coating	Locating Device & Location	"T" if not Std (Xtreme)
Notes and or other Alteration requests Qty ☐						

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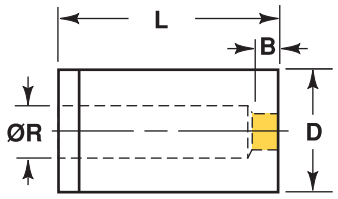
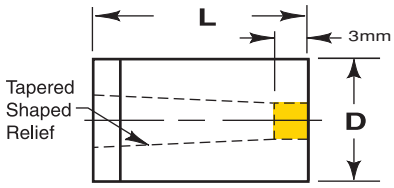
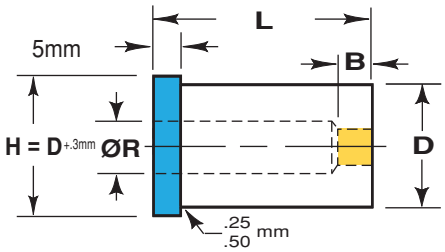


☐ **Press-Fit C'Bore Relief**

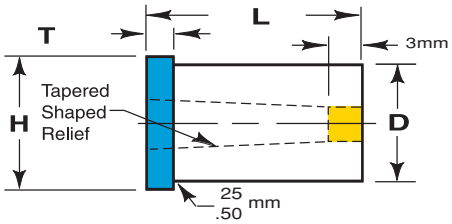


☐ **Press-Fit Tapered Relief**

☐ **Press-Fit Precision Tolerance**

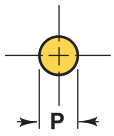


☐ **Headed C'Bore Relief**



☐ **Headed Tapered Relief**

☐ **Headed Precision Tolerance**



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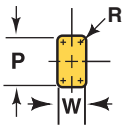

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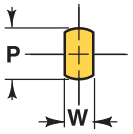

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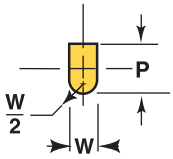

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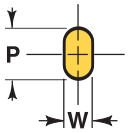

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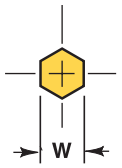

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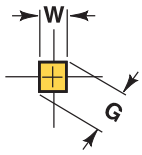

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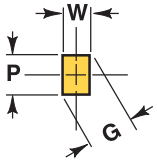

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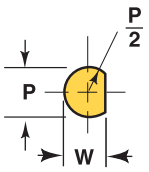

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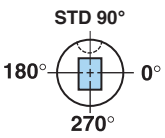
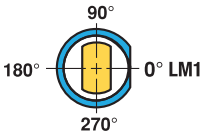
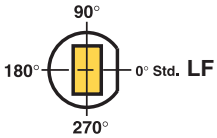
Locating Devices



Punches use Reflective View





LM3 Std Dowel is .3mm Dia.
Custom Dowel Size (Dia.) ☐

**All tolerances will be held to industry standards unless otherwise specified*

Company Name	Tool #	Part #/ Det #	Description (Porter Precision Products)			
Body Dia "D"	Length "L"	Material	Nose Length "B" or L_2	Coating	Locating Device & Location	"T" if not Std (Xtreme)
Notes and or other Alteration requests **Qty** ☐						

Policy

Porter Precision Products guarantees its products to meet catalog specifications which are interchangeable and equivalent to I.S.O. standards. Print items and special description call-outs will be manufactured to the customer's specifications. No other warranties are expressed or implied.

All dimensions not specifically toleranced will be manufactured to industry (our Catalog) standards, regardless of the decimal place call-out. To eliminate misunderstandings, include tolerance charts on your prints or specifically tolerance critical dimensions.

Steel type is to be specified by the customer. If not specified, we will supply the first material listed in the catalog. It is always best to include your material choice in the part call-out as shown in the ordering examples.

Terms & Conditions

Prices- Net each and subject to change without notice.

Minimum Order Charge-There is no minimum order charge on manufactured items.

Terms-Net 30 Days, F.O.B. Shipping point
we also accept American Express, Master Card, and Visa

Credit- Orders are subject to the approval of our credit department. To expedite new accounts, furnish bank reference and three supplier references.

Returns- Credit claims for our manufactured items must be made within 45 days of shipment date. Stock blanks are returnable for credit less a 25% restocking fee. If they are exchanged for items of equal or greater value they can be returned for full credit. All items altered by us to the customer's specifications are the property of the buyer and are not returnable unless they do not meet catalog or print tolerances. Any item that has been altered by the customer is the said customer's responsibility and is for no reason returnable.

Over/Under Shipments- Manufactured products can vary up to 10% of the quantity ordered depending on the complexity of the part. If no variation is acceptable this information must be supplied to us at the time of quoting.

Cancellation- The customer will be responsible for a pro-rated charge to cover any work completed prior to cancellation.

Infringements- Customer shall assume all responsibility and undertake the defense of all lawsuits for infringements on patents brought against Porter Precision Products for the manufacture of products named in an order when said products are made according to drawings, samples, and/or descriptions that have been supplied by the customer.

Items supplied but not manufactured by us- All policies/terms & conditions set forth by the manufacturer of said items are applicable. Contact Porter for information regarding various policies.

PORTER PRECISION PRODUCTS CO.

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