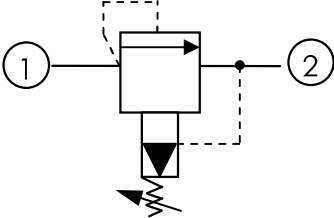
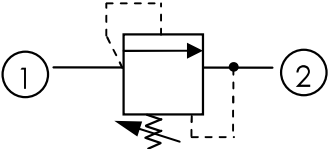
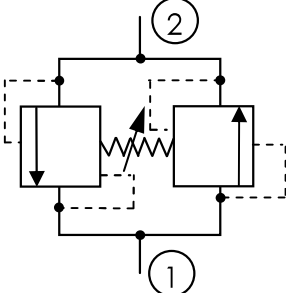
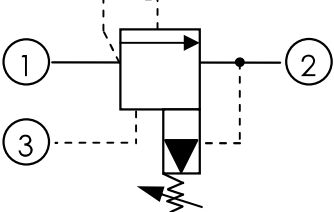


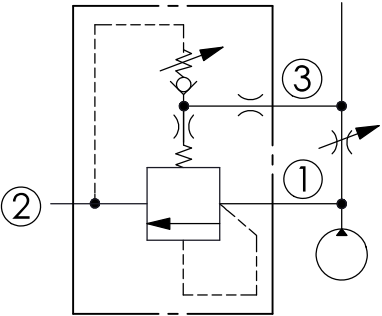
PRODUCTS SELECTION GUIDE

RELIEF VALVES

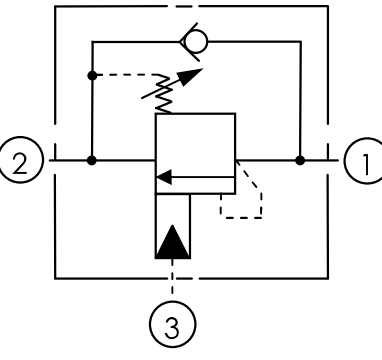
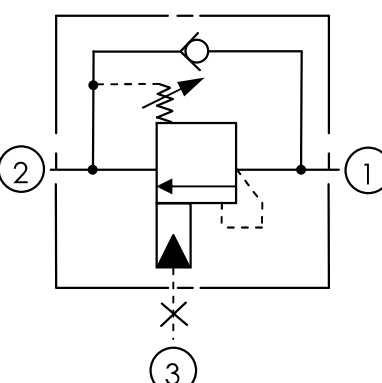
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Pilot Operated Balanced Piston					
	RP-10A-20	95	350	10A -2	B.101.101
	RP-3A-20	200	350	3A -2	B.101.102
	RP-16A-20	380	350	16A -2	B.101.103
	RP-18A-20	760	350	18A -2	B.101.104
	RP-10W-20	95	350	10W -2	B.101.112
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Direct Acting					
	RD-08W-20	20	350	08W -2	B.102.101
	RD-08W-23	3	420	08W -2	B.102.102
	RD-10A-25	95	350	10A -2	B.102.201
	RD-3A-25	200	350	3A -2	B.102.202
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Bi-Directional					
	CR-10W-20	60	240	10W -2	B.103.102
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Ventable, Pilot Operated Balanced Piston					
	RV-11A-30	60	350	11A -3	B.105.101
	RV-2A-30	120	350	2A -3	B.105.102
	RV-17A-30	240	350	17A -3	B.105.103
	RV-19A-30	480	350	19A -3	B.105.104

PRODUCTS SELECTION GUIDE

RELIEF VALVES

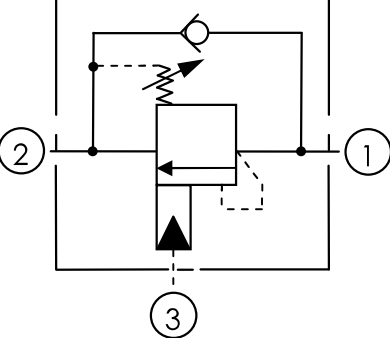
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Modulating Element with Relief Function					
	RV-11A-3B (Piston Without Orifice) Compensating Pressure is 7 bar	40	350	11A-3	B.105.201
	RV-2A-3B (Piston Without Orifice) Compensating Pressure is 8 bar	80	350	2A-3	B.105.202

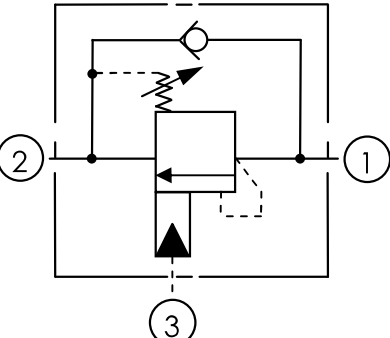
COUNTERBALANCE VALVES

SYMBOL	Main Code	Flow l/min	Pressure Setting bar	Cavity- Tooling	Pag.
Standard 280/350 Bar Maximum Setting					
	CB-11A(3:1,1.5:1)	60	280	11A-3	B.121.101
	CB-2A(3:1,1.5:1)	120	280	2A-3	B.121.102
	CB-17A(3:1,1.5:1)	240	280	17A-3	B.121.103
	CB-19A(3:1,1.5:1)	480	280	19A-3	B.121.104
	CB-11A(10:1,4.5:1)	60	350	11A-3	B.121.201
	CB-2A(10:1,4.5:1)	120	350	2A-3	B.121.202
	CB-17A(10:1,4.5:1)	240	350	17A-3	B.121.203
	CB-19A(10:1,4.5:1)	480	350	19A-3	B.121.204
SYMBOL	Main Code	Flow l/min	Pressure Setting bar	Cavity- Tooling	Pag.
Without Pilot Assist, 3 Port Cavity					
	CB-11A-23	60	280	11A-3	B.122.101
	CB-2A-23	120	280	2A-3	B.122.102
	CB-17A-23	240	280	17A-3	B.122.103
	CB-19A-23	480	280	19A-3	B.122.104

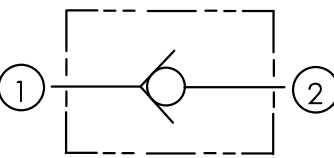
PRODUCTS SELECTION GUIDE

COUNTERBALANCE VALVES

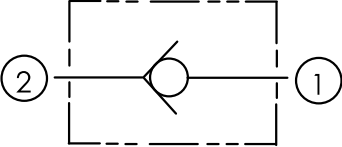
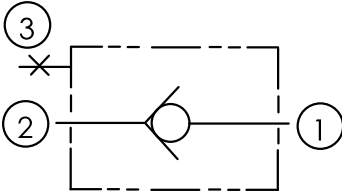
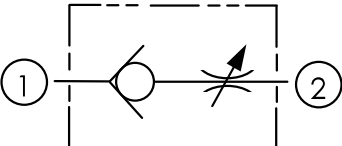
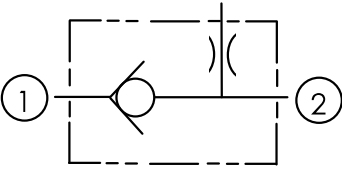
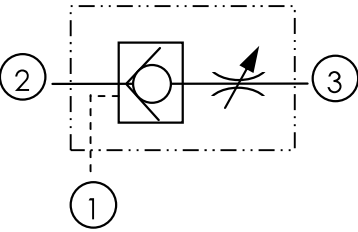
SYMBOL	Main Code	Flow l/min	Pressure Setting bar	Cavity- Tooling	Pag.
Restrictive 280 Bar Maximum Setting					
	CB-11A-3C-Y-Z-20	20	280	11A-3	B.123.101

SYMBOL	Main Code	Flow l/min	Pressure Setting bar	Cavity- Tooling	Pag.
With Stainless Steel External Components					
	CB-11A-X-Y-Z-P (3:1.) (Standard) 3:1 Port 3 with seals (Standard)	60	280	11A-3	B.129.101
	CB-11A-X-Y-Z-P (1.5:1) (Option) 1.5:1 Port 3 with seals (Option)				
	CB-11A-30-Y-Z-P (10:1)	60	350	11A-3	B.129.201
	CB-11A-34-Y-Z-P (4.5:1)				

CHECK VALVES

SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
	CV-13A-20	80	350	13A-2	B.130.101
	CV-5A-20	160	350	5A-2	B.130.102
	CV-16A-20	320	350	16A-2	B.130.103
	CV-18A-20	640	350	18A-2	B.130.104
	CV-08W-20	30	240	08W-2	B.130.111
	CV-10W-20	60	240	10W-2	B.130.112
	CV-12W-20	90	240	12W-2	B.130.113
	CV-16W-20	150	240	16W-2	B.130.114
	CV-42W-20	350	240	42W-2	B.130.116
	CV-08W-22	30	350	08W-2	B.130.201
	CV-17E-22	60	350	17E-2	B.130.202
	CV-21E-22	100	350	21E-2	B.130.203

PRODUCTS SELECTION GUIDE

CHECK VALVES					
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Free flow side to nose check valve					
	CV-13A-21	60	350	13A-2	B.130.301
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
	CV-11A-21	60	350	11A-3	B.130.501
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
With Screw Adjustment					
	CV-08W-20	30	240	08W-2	B.132.101
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
With External Port					
External Port 	CV-08W-28	30	240	08W-2	B.133.101
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Pilot-To-Open with Adjustment					
	CO-08W-30	30	240	08W-3	B.134.101

PRODUCTS SELECTION GUIDE

CHECK VALVES

SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Pilot-To-Open					
	CO-11A-30	60	350	11A-3	B.137.101
	CO-11A-3D (Sealed Pilot Piston)				
	CO-2A-30	120	350	2A-3	B.137.102
	CO-17A-30	240	350	17A-3	B.137.103
	CO-19A-30	480	350	19A-3	B.137.104
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Pilot-To-Open					
	CO-08W-30 (Check Spring Bias) (Min. 1.7 bar)	30	240	08W-3	B.138.101
	CO-08W-3A (Sealed Pilot Piston) (Check Spring Bias) (Min. 6.9 bar)				
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Vented pilot-to-open check valve with external pilot port					
	CO-2A-30-Y-G02	120	350	2A-3	B.139.102
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Check, Pilot-To-Close					
	CC-11A	80	350	11A-3	B.702.101
	CC-2A	160	350	2A-3	B.702.102
	CC-17A	320	350	17A-3	B.702.103
	CC-19A	640	350	19A-3	B.702.104

PRODUCTS SELECTION GUIDE

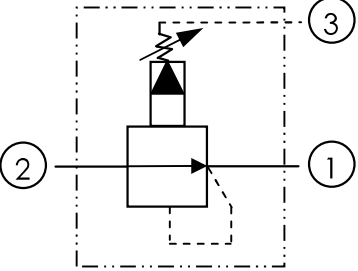
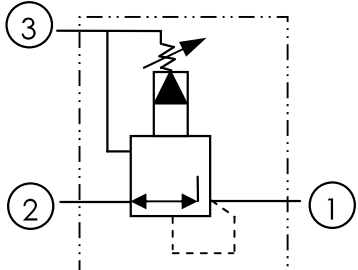
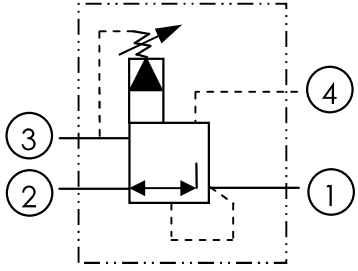
SEQUENCE VALVES

SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Pilot Operated, Balanced Piston					
	SP-11A-30	60	350	11A-3	B.201.101
	SP-2A-30	120	350	2A-3	B.201.102
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
	SQ-08W-33 (External Pilot, Internal Drain)	See Performance Chart	240	08W-3	B.202.101
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
	SQ-08W-30 (Internal Pilot & Drain)	22	240	08W-3	B.203.101

REDUCING/RELIEVING VALVES

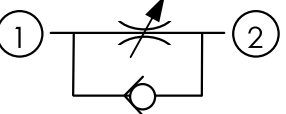
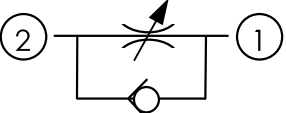
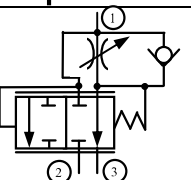
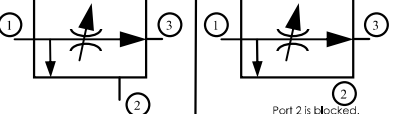
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Direct Acting Reducing/Relieving					
	PD-11A-30	40	350	11A-3	B.211.101
	PD-2A-30	80	350	2A-3	B.211.102
	PD-17A-30	160	350	17A-3	B.211.103
	PD-19A-30	320	350	19A-3	B.211.104

PRODUCTS SELECTION GUIDE

REDUCING/RELIEVING VALVES					
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Pilot Operated Reducing					
	PB-11A-30	40	350	11A-3	B.221.101
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Pilot Operated Reducing/Relieving					
	PP-11A-30	40	350	11A-3	B.222.101
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Pilot Operated Reducing/Relieving, Ventable					
	PV-22A-40	80	350	22A-4	B.223.102

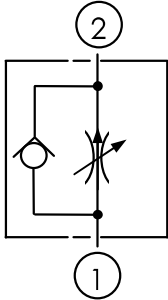
PRODUCTS SELECTION GUIDE

FLOW CONTROL VALVES

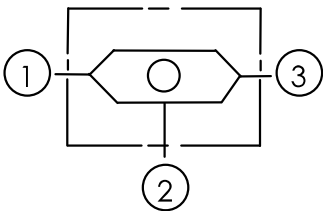
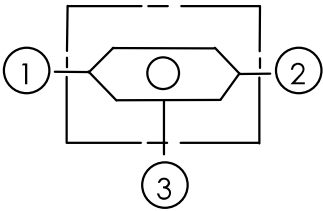
SYMBOL	Main Code	Flow l/min $\Delta P=7$ bar	Pressure bar	Cavity- Tooling	Pag.
Cartridge Restrictors					
	NV-08W-20	36	350	08W-2	B.301.101
	NV-10W-20	55	350	10W-2	B.301.102
	NV-12W-20	125	350	12W-2	B.301.103
	NV-16W-20	165	350	16W-2	B.301.104
	NV-13A-20	25	350	13A-2	B.302.101
	NV-5A-20	50	350	5A-2	B.302.102
	NV-17E-20	58	350	17E-2	B.303.102
	NV-21E-20	126	350	21E-2	B.303.103
SYMBOL	Main Code	Flow l/min $\Delta P=7$ bar	Pressure bar	Cavity- Tooling	Pag.
With Reverse Flow Check					
	NC-08W-20	35	350	08W-2	B.304.101
SYMBOL	Main Code	Flow l/min $\Delta P=7$ bar	Pressure bar	Cavity- Tooling	Pag.
With Reverse Flow Check					
	NC-13A-21	36	350	13A-2	B.305.101
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Bypass/Pressure Compensated					
	FR-10W-33	0-38 (nominal)	240	10W-3	B.321.102
		0-57 (max)			
	FR-10W-31	0-19 (nominal)	240	10W-3	B.321.103
		0-26 (max)			

PRODUCTS SELECTION GUIDE

FLOW CONTROL VALVES

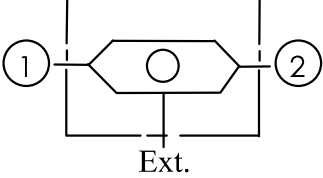
FLOW CONTROL VALVES					
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Fully adjustable pressure compensated flow control valve with reverse flow check					
	FR-13A-20	23	350	13A -2	B.324.101
	FR-5A-20	45	350	5A -2	B.324.102
	FR-16A-20	95	350	16A -2	B.324.103
	FR-18A-20	200	350	18A -2	B.324.104
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Regulator, Pressure-Compensated					
	FR-10W-20	23	240	10W -2	B.331.102

SHUTTLE VALVES

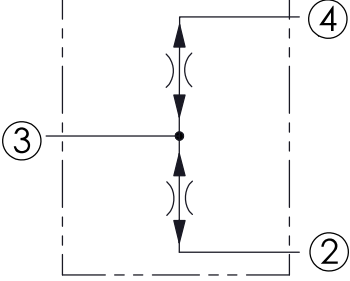
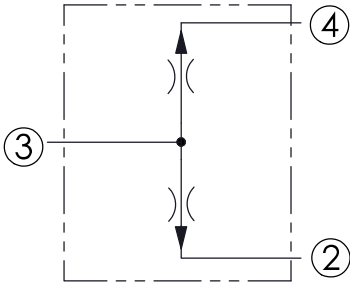
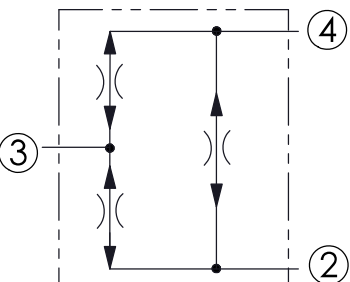
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Single Ball Shuttle Valve With Signal At Port 2					
	LS-11A-30	10	350	11A -3	B.502.101
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Single Ball Shuttle Valve With Signal At Port 3					
	LS-11A-33	10	350	11A -3	B.503.101

PRODUCTS SELECTION GUIDE

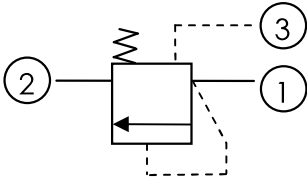
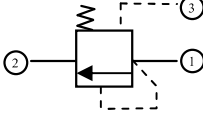
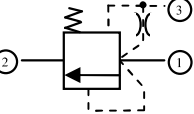
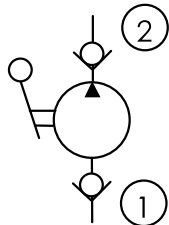
SHUTTLE VALVES

SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Single Ball Shuttle Valve With Signal at External Port					
	LS-13A-20	10	350	13A -2	B.505.101

FLOW DIVIDER/COMBINER VALVES

SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Flow Divider/Combiner					
	FD-10W-40	54	350	10W -4	B.601.112
	FD-16W-40	165	350	16W -4	B.601.114
Port ① not used					
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Flow Divider					
	FD-10W-41	54	350	10W -4	B.602.112
	FD-16W-41	165	350	16W -4	B.602.114
Port ① not used					
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Flow Divider/Combiner Anti-Stall Features					
	FD-10W-42	54	350	10W -4	B.603.112
	FD-16W-42	165	350	16W -4	B.603.114
Port ① not used					

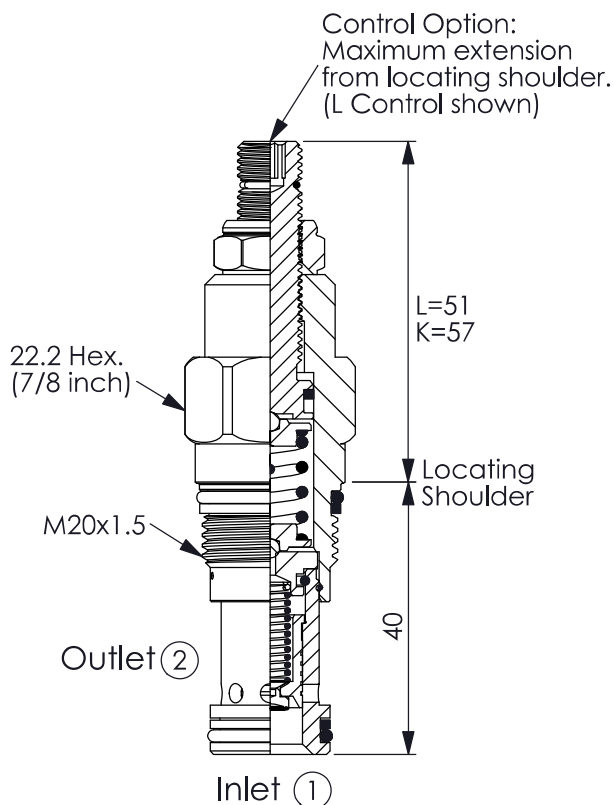
PRODUCTS SELECTION GUIDE

LOGIC ELEMENTS					
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Normally Closed Modulating Element					
	LR-11A-36	6	350	11A -3	B.704.100
SYMBOL	Main Code	Flow l/min	Pressure bar	Cavity- Tooling	Pag.
Normally Closed Modulating Element					
X:30  X:31 	LR-11A-30 (External Pilot)	60	350	11A -3	B.704.101
	LR-11A-31 (Internal Pilot,Port 1 to Port 3)				
	LR-2A-30 (External Pilot)	120	350	2A -3	B.704.102
	LR-2A-31 (Internal Pilot,Port 1 to Port 3)				
	LR-17A-30 (External Pilot)	240	350	17A -3	B.704.103
	LR-17A-31 (Internal Pilot,Port 1 to Port 3)				
	LR-19A-30 (External Pilot)	480	350	19A -3	B.704.104
	LR-19A-31 (Internal Pilot,Port 1 to Port 3)				
HAND PUMP					
SYMBOL	Main Code	Displace- ment	Pressure bar	Cavity- Tooling	Pag.
Cartridge Hand Pump					
	HP-10W-20	7.4 c.c. per stroke	210	10W -2	B.801.102
		10.6 c.c. per stroke			

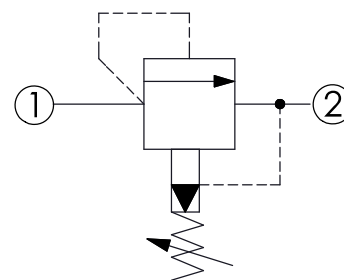
RELIEF VALVE

(Pilot Operated Balanced Piston)

Ordering Code: **RP-10A-X-Y-Z**



UNIT:mm



TECHNICAL DATA

Max.Operating pressure: 350 bar

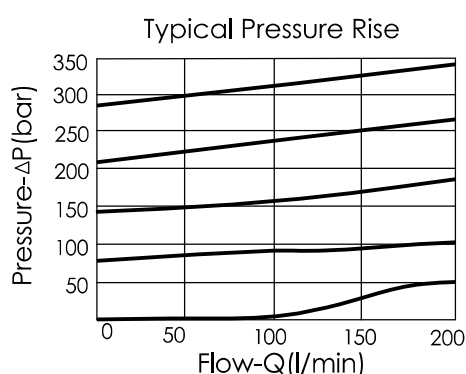
Rated flow: 95 l/min

Cavity-Tooling: 10A-2

Installation torque: 40-50 Nm

Weight: 0.14 kg

Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.



X OPERATION

20 1 to 2 (P to T)

Y

SPRINGS

ADJUSTMENT RANGES

A 7 to 210 bar (70 bar Standard Setting)

B 3.5 to 105 bar (70 bar Standard Setting)

C 10 to 420 bar (70 bar Standard Setting)

D 2 to 55 bar (25 bar Standard Setting)

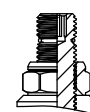
E 2 to 25 bar (14 bar Standard Setting)

W 10 to 315 bar (70 bar Standard Setting)

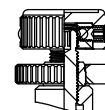
Z

OPTIONS

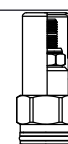
L Leakproof hex. socket screw.



K Handknob with Lock Konb.



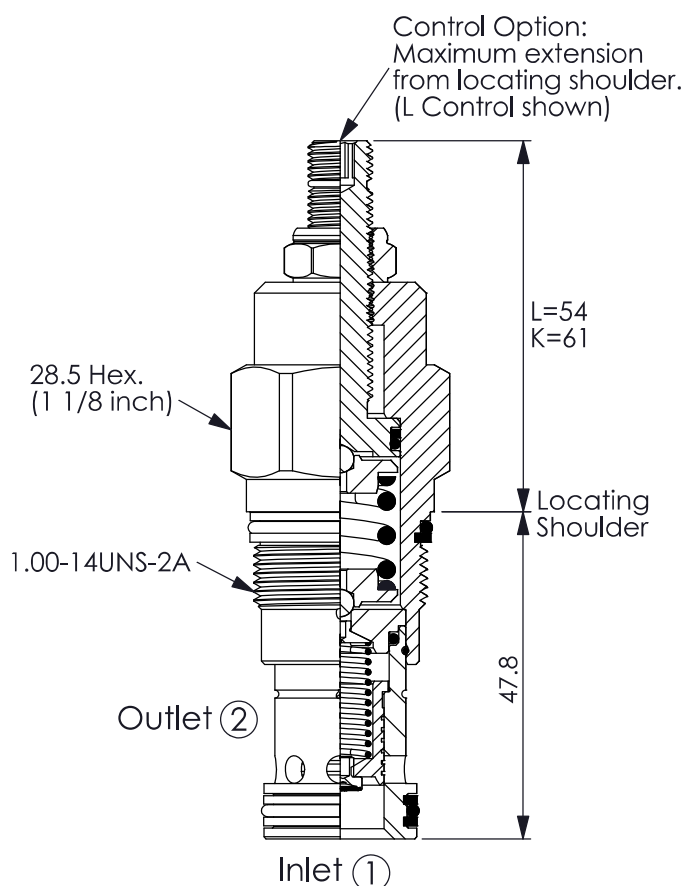
C Tamper Resistant Cover



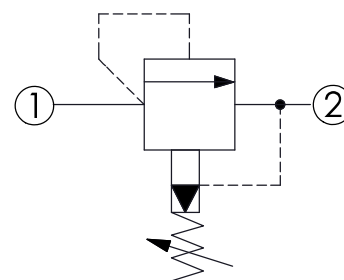
RELIEF VALVE

(Pilot Operated Balanced Piston)

Ordering Code: **RP-3A-X-Y-Z**



UNIT:mm



TECHNICAL DATA

Max.Operating pressure: 350 bar

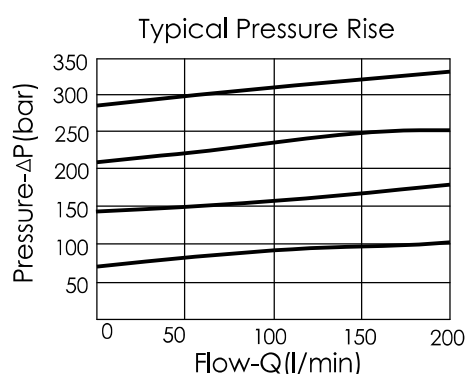
Rated flow: 200 l/min

Cavity-Tooling: 3A-2

Installation torque: 60-70 Nm

Weight: 0.25 kg

Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.



X OPERATION

20 1 to 2 (P to T)

Y

SPRINGS

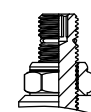
ADJUSTMENT RANGES

A	7 to 210 bar (70 bar Standard Setting)
B	3.5 to 105 bar (70 bar Standard Setting)
C	10 to 420 bar (70 bar Standard Setting)
D	2 to 55 bar (25 bar Standard Setting)
E	2 to 25 bar (14 bar Standard Setting)
W	10 to 315 bar (70 bar Standard Setting)

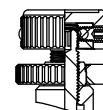
Z

OPTIONS

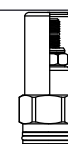
L Leakproof hex. socket screw.



K Handknob with Lock Konb.



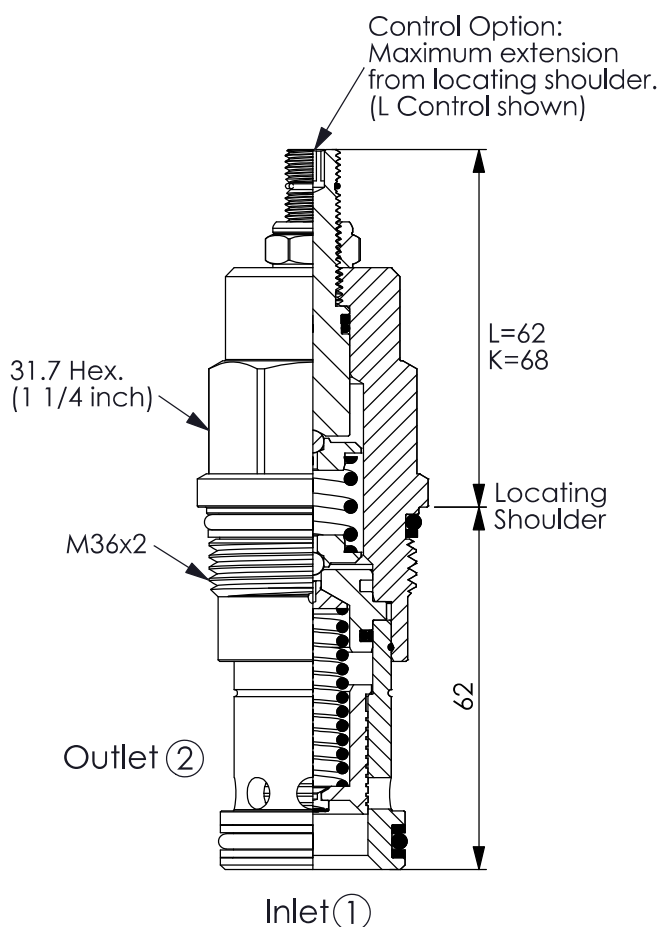
C Tamper Resistant Cover.



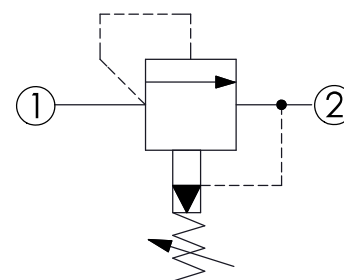
RELIEF VALVE

(Pilot Operated Balanced Piston)

Ordering Code: **RP-16A-X-Y-Z**



UNIT:mm



TECHNICAL DATA

Max.Operating pressure: 350 bar

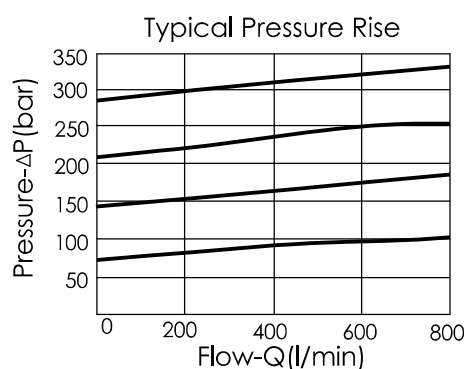
Rated flow: 380 l/min

Cavity-Tooling: 16A-2

Installation torque: 200-215 Nm

Weight: 0.53 kg

Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.



X OPERATION

20 1 to 2 (P to T)

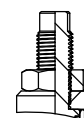
Y SPRINGS

ADJUSTMENT RANGES

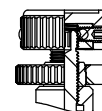
A	7 to 210 bar (70 bar Standard Setting)
B	3.5 to 105 bar (70 bar Standard Setting)
C	10 to 420 bar (70 bar Standard Setting)
D	2 to 55 bar (25 bar Standard Setting)
E	2 to 25 bar (14 bar Standard Setting)
W	10 to 315 bar (70 bar Standard Setting)

Z OPTIONS

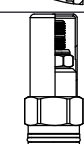
L Leakproof hex. socket screw.



K Handknob with Lock Konb.



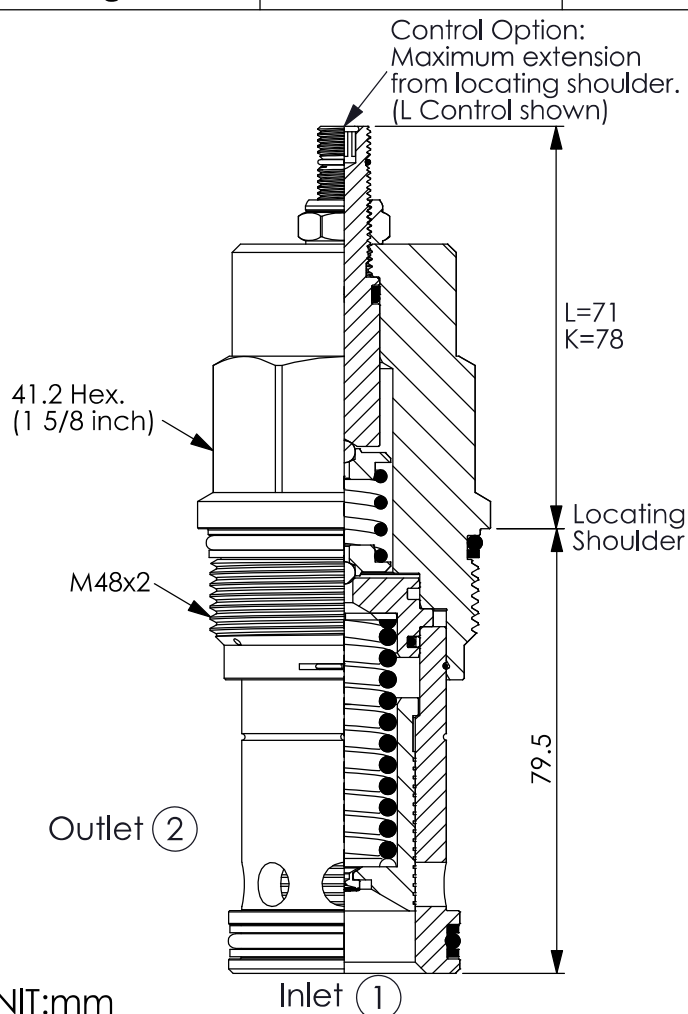
C Tamper Resistant Cover.



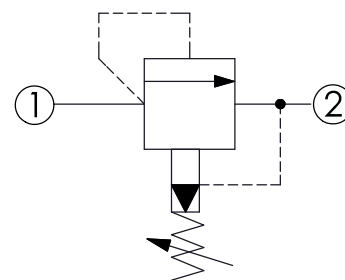
RELIEF VALVE

(Pilot Operated Balanced Piston)

Ordering Code: **RP-18A-X-Y-Z**



UNIT:mm



TECHNICAL DATA

Max.Operating pressure: 350 bar

Rated flow: 760 l/min

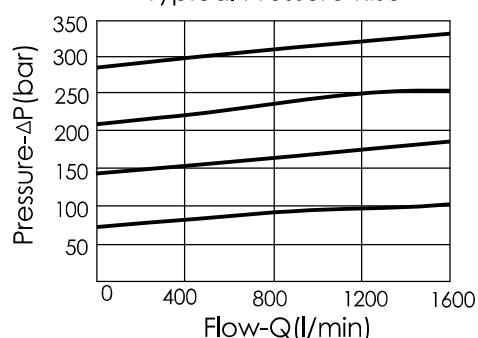
Cavity-Tooling: 18A-2

Installation torque: 465-500 Nm

Weight: 1.15 kg

Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.

Typical Pressure Rise



X OPERATION

20 1 to 2 (P to T)

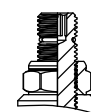
Y SPRINGS

ADJUSTMENT RANGES

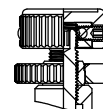
A	7 to 210 bar (70 bar Standard Setting)
B	3.5 to 105 bar (70 bar Standard Setting)
C	10 to 420 bar (70 bar Standard Setting)
D	2 to 55 bar (25 bar Standard Setting)
E	2 to 25 bar (14 bar Standard Setting)
W	10 to 315 bar (70 bar Standard Setting)

Z OPTIONS

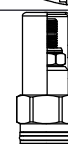
L Leakproof hex. socket screw.



K Handknob with Lock Konb.



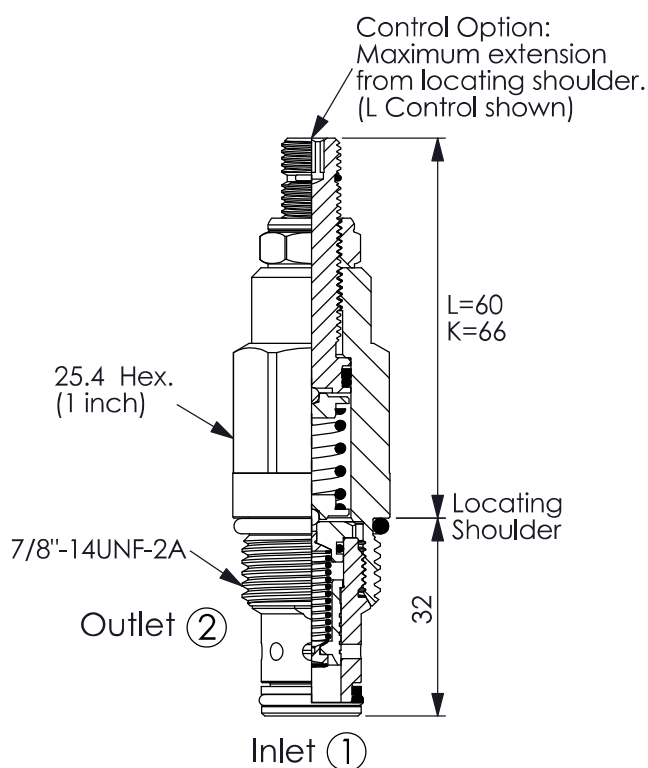
C Tamper Resistant Cover.



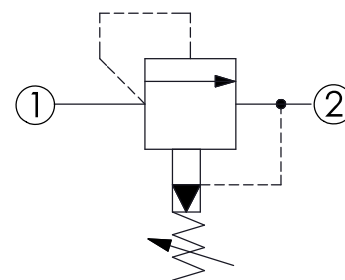
RELIEF VALVE

(Pilot Operated Balanced Piston)

Ordering Code: **RP-10W-X-Y-Z**

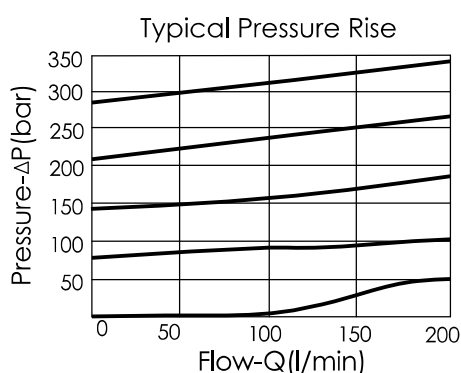


UNIT:mm



TECHNICAL DATA

Max.Operating pressure:	350 bar
Rated flow:	95 l/min
Cavity-Tooling:	10W-2
Installation torque:	35-45 Nm
Weight:	0.16 kg



X OPERATION

20 1 to 2 (P to T)

Y

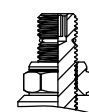
SPRINGS

ADJUSTMENT RANGES

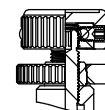
A	7 to 210 bar (70 bar Standard Setting)
B	3.5 to 105 bar (70 bar Standard Setting)
C	10 to 420 bar (70 bar Standard Setting)
D	2 to 55 bar (25 bar Standard Setting)
E	2 to 25 bar (14 bar Standard Setting)
W	10 to 315 bar (70 bar Standard Setting)

Z OPTIONS

L Leakproof hex. socket screw.



K Handknob with Lock Konb.



C Tamper Resistant Cover



RELIEF VALVE

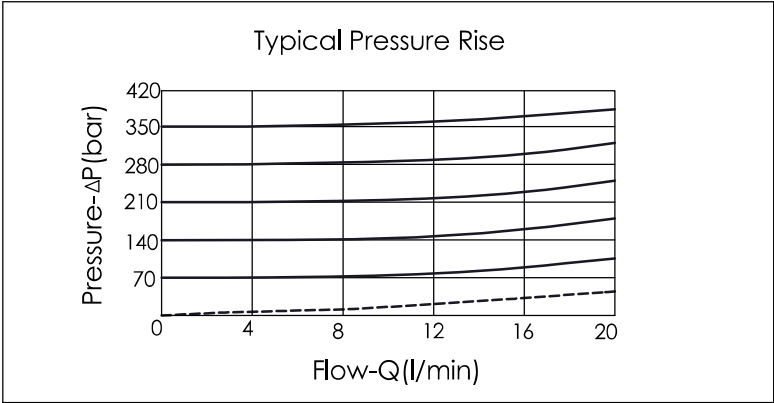
(Direct Acting)

Ordering Code: **RD-08W-X-Y-Z**

UNIT:mm

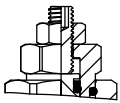
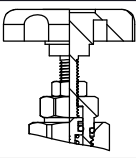
TECHNICAL DATA

Max. pressure:	350	bar
Rated flow:	20	l/min
Cavity-Tooling:	08W-2	
Installation torque:	25-35	Nm
Weight:	0.11	kg



X	OPERATION	
20	1 to 2 (P to T)	

Y	PRESSURE SETTING	
A	80-210 bar	
D	30-55 bar	
K	40-155 bar	
W	150 -350 bar	

Z	OPTIONS	
L	Leakproof hex. socket screw.	
F	Handknob and locknut.	

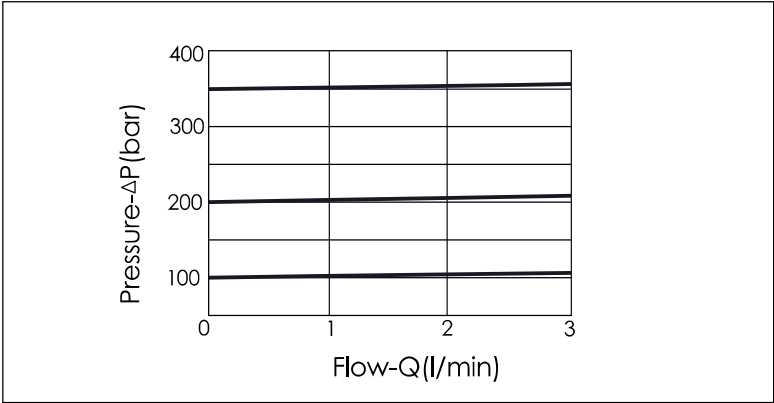
RELIEF VALVE

(Direct Acting)

Ordering Code: **RD-08W-X-Y-Z**

UNIT:mm

TECHNICAL DATA		
Max. pressure:	420	bar
Rated flow:	3	l/min
Cavity-Tooling:	08W-2	
Installation torque:	25-35	Nm
Weight:	0.10	kg



Y	PRESSURE SETTING	
A	35-210 bar	
B	22-105 bar	
C	70-420 bar	
D	10-55 bar	

X	OPERATION	
23	Direct Acting 1 to 2 (P to T)	

Z	OPTIONS	
L	Leakproof hex. socket screw.	
F	Handknob and locknut.	

RELIEF VALVE
(Direct Acting)

Ordering Code: **RD-10A-X-Y-Z**

Control Option:
Maximum extension
from locating shoulder.
(L Control shown)

22.2 Hex.
(7/8 inch)

57

Locating
Shoulder

M20x1.5

40

Outlet ②

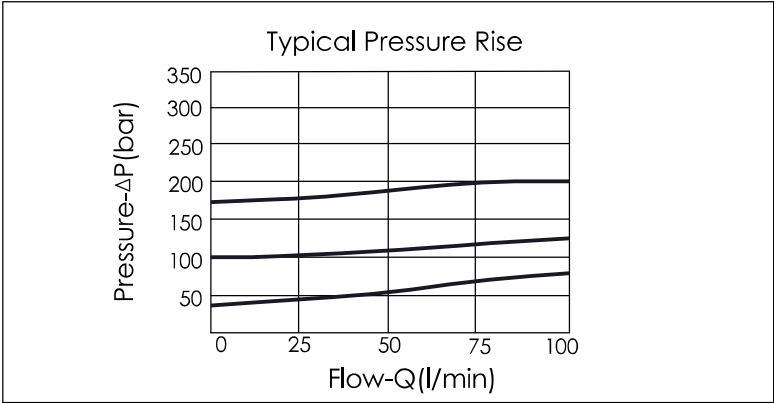
Inlet ①

UNIT:mm

TECHNICAL DATA

Max. pressure:	350	bar
Rated flow:	95	l/min
Cavity-Tooling:	10A-2	
Installation torque:	40-50	Nm
Weight:	0.17	kg

Maximum leakage = 10 drops/min. at reseal.



X	OPERATION	
25	Direct Acting 1 to 2 (P to T)	

Y	PRESSURE SETTING	
A	35-210 bar (70 bar Standard Setting)	
C	70-420 bar (70 bar Standard Setting)	
D	2-55 bar (25 bar Standard Setting)	
E	7-25 bar (14 bar Standard Setting)	

Z	OPTIONS	
L	Leakproof hex. socket screw.	

RELIEF VALVE
(Direct Acting)

Ordering Code: **RD-3A-X-Y-Z**

Control Option:
Maximum extension
from locating shoulder.
(L Control shown)

28.5 Hex.
(1 1/8 inch)

1.00-14UNS-2A

64

Locating
Shoulder

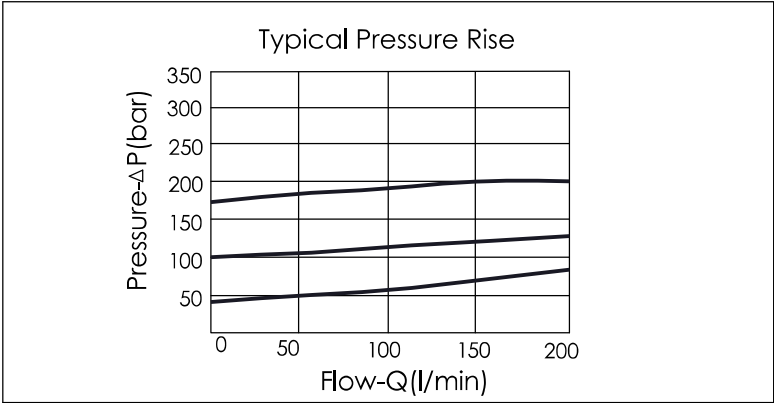
47.8

Outlet ②

Inlet ①

UNIT:mm

TECHNICAL DATA		
Max. pressure:	350	bar
Rated flow:	200	l/min
Cavity-Tooling:	3A-2	
Installation torque:	60-70	Nm
Weight:	0.30	kg
Maximum leakage = 10 drops/min. at reseal.		



Y	PRESSURE SETTING	
A	35-210 bar (70 bar Standard Setting)	
C	70-420 bar (70 bar Standard Setting)	

X	OPERATION	
25	Direct Acting 1 to 2 (P to T)	

Z	OPTIONS	
L	Leakproof hex. socket screw.	

RELIEF VALVE

(Bi-Directional)

Ordering Code:

CR-10W-X-Y-Z

Control Option:
Maximum extension
from locating shoulder.
(L Control shown)

25.4 Hex.

7/8"-14UNF-2A

Out (In) ②

In (Out) ①

80

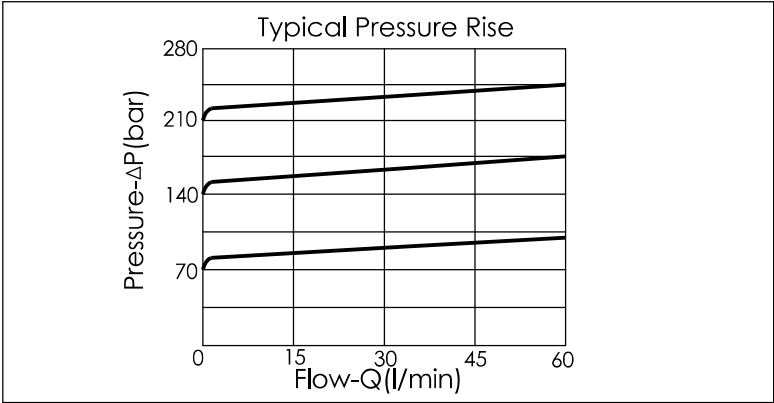
32

Locating Shoulder

UNIT:mm

TECHNICAL DATA

Max.Operating pressure:	240	bar
Rated flow:	60	l/min
Cavity-Tooling:	10W-2	
Installation torque:	35-45	Nm
Weight:	0.24	kg



X	OPERATION	
20	Standard Type	

Y	SPRINGS	
	ADJUSTMENT RANGES	
A	160 to 210 bar (180 bar Standard Setting)	
K	14 to 168 bar (80 bar Standard Setting)	

Z	OPTIONS	
L	Leakproof hex. socket screw.	
E	Handknob and locknut.	
B	Handknob and aluminumlocknut.	

RELIEF VALVE
(Ventable)

Ordering Code: **RV-11A-X-Y-Z**

Control Option:
Maximum extension
from locating shoulder.
(L Control shown)

22.2 Hex.
(7/8 inch)

Vent ③

M20x1.5

Out ②

In ①

Locating Shoulder

35.1

L=64
K=70

UNIT:mm

①

②

③

TECHNICAL DATA

Max.Operating pressure: 350 bar

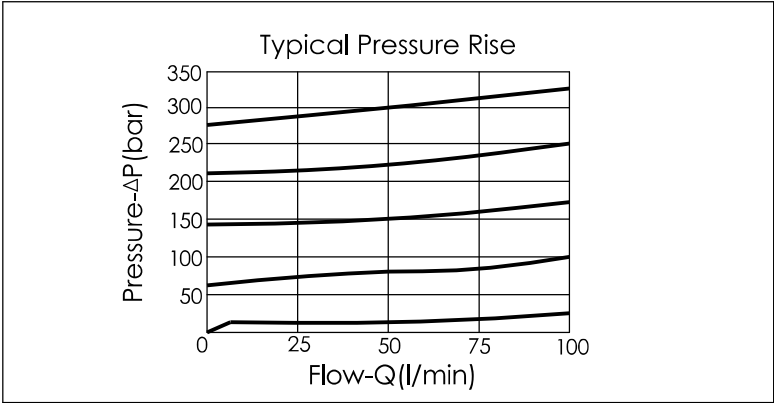
Rated flow: 60 l/min

Cavity-Tooling: 11A-3

Installation torque: 40-50 Nm

Weight: 0.15 kg

Will accept maximum pressure at port 2;
suitable for use in cross port relief circuits.
If used in cross port relief circuits, consider
spool leakage.



X	OPERATION	
30	Standard Type	

Y	SPRINGS	
	ADJUSTMENT RANGES	
A	7 to 210 bar (70 bar Standard Setting)	
B	3.5 to 105 bar (70 bar Standard Setting)	
C	10 to 420 bar (70 bar Standard Setting)	
D	1.7 to 55 bar (14 bar Standard Setting)	
H	2 to 210 bar (70 bar Standard Setting)	
W	10 to 315 bar (70 bar Standard Setting)	

Z	OPTIONS	
L	Leakproof hex. socket screw.	
K	Handknob with Lock Konb.	
C	Tamper Resistant Cover.	

RELIEF VALVE

(Ventable)

Ordering Code: **RV-2A-X-Y-Z**

Control Option:
Maximum extension
from locating shoulder.
(L Control shown)

28.5 Hex.
(1 1/8 inch)

Vent ③

1.00-14UNS-2A

Out ②

In ①

L=71
K=78

Locating
Shoulder

35.1

UNIT:mm

TECHNICAL DATA

Max.Operating pressure: 350 bar

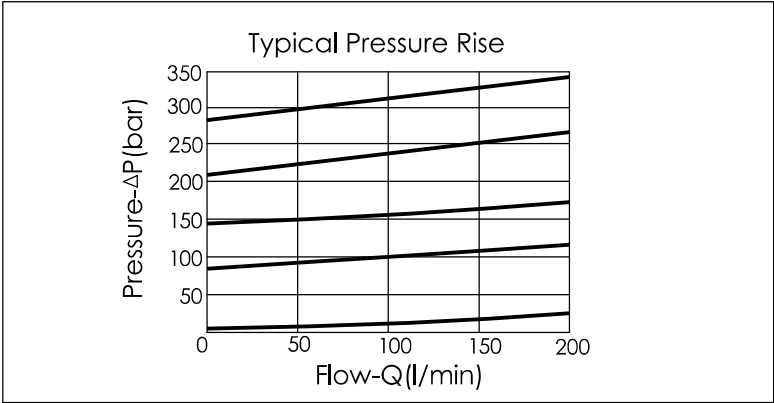
Rated flow: 120 l/min

Cavity-Tooling: 2A-3

Installation torque: 60-70 Nm

Weight: 0.28 kg

Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.



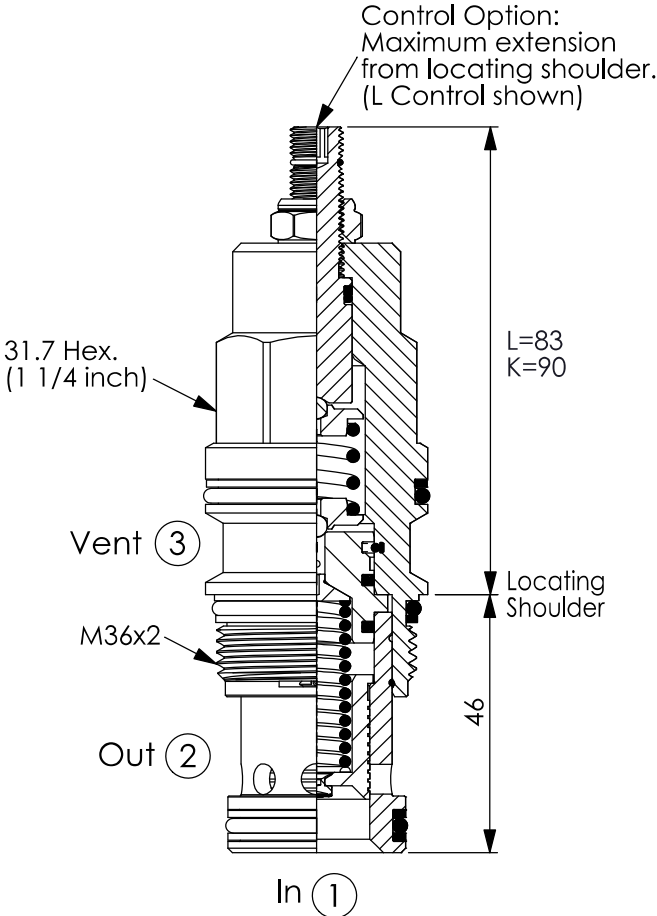
X	OPERATION	
30	Standard Type	

Y	SPRINGS	
	ADJUSTMENT RANGES	
A	7 to 210 bar (70 bar Standard Setting)	
B	3.5 to 105 bar (70 bar Standard Setting)	
C	10 to 420 bar (70 bar Standard Setting)	
D	1.7 to 55 bar (14 bar Standard Setting)	
H	2 to 210 bar (70 bar Standard Setting)	
W	10 to 315 bar (70 bar Standard Setting)	

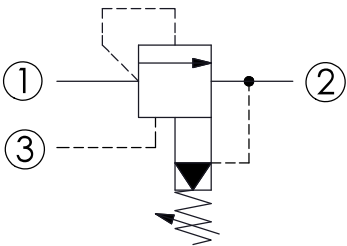
Z	OPTIONS	
L	Leakproof hex. socket screw.	
K	Handknob with Lock Konb.	
C	Tamper Resistant Cover.	

RELIEF VALVE
(Ventable)

Ordering Code: **RV-17A-X-Y-Z**



UNIT:mm



TECHNICAL DATA

Max.Operating pressure: 350 bar

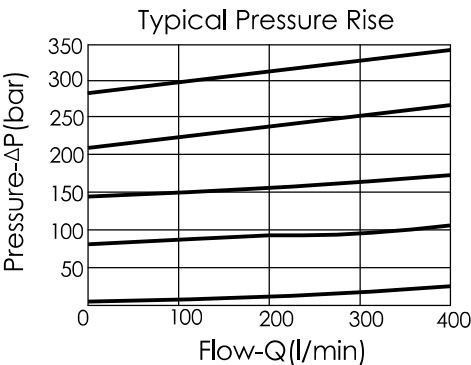
Rated flow: 240 l/min

Cavity-Tooling: 17A-3

Installation torque: 200-215 Nm

Weight: 0.61 kg

Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.



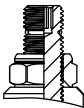
X OPERATION

30 Standard Type

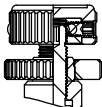
Y	SPRINGS	
	ADJUSTMENT RANGES	
A	7 to 210 bar (70 bar Standard Setting)	
B	3.5 to 105 bar (70 bar Standard Setting)	
C	10 to 420 bar (70 bar Standard Setting)	
D	1.7 to 55 bar (14 bar Standard Setting)	
H	2 to 210 bar (70 bar Standard Setting)	
W	10 to 315 bar (70 bar Standard Setting)	

Z OPTIONS

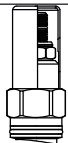
L Leakproof hex. socket screw.



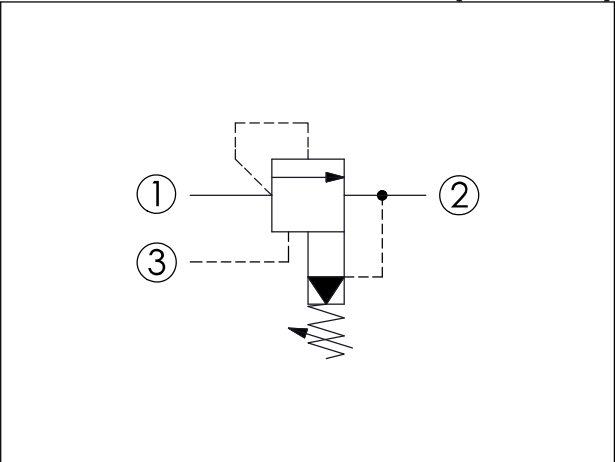
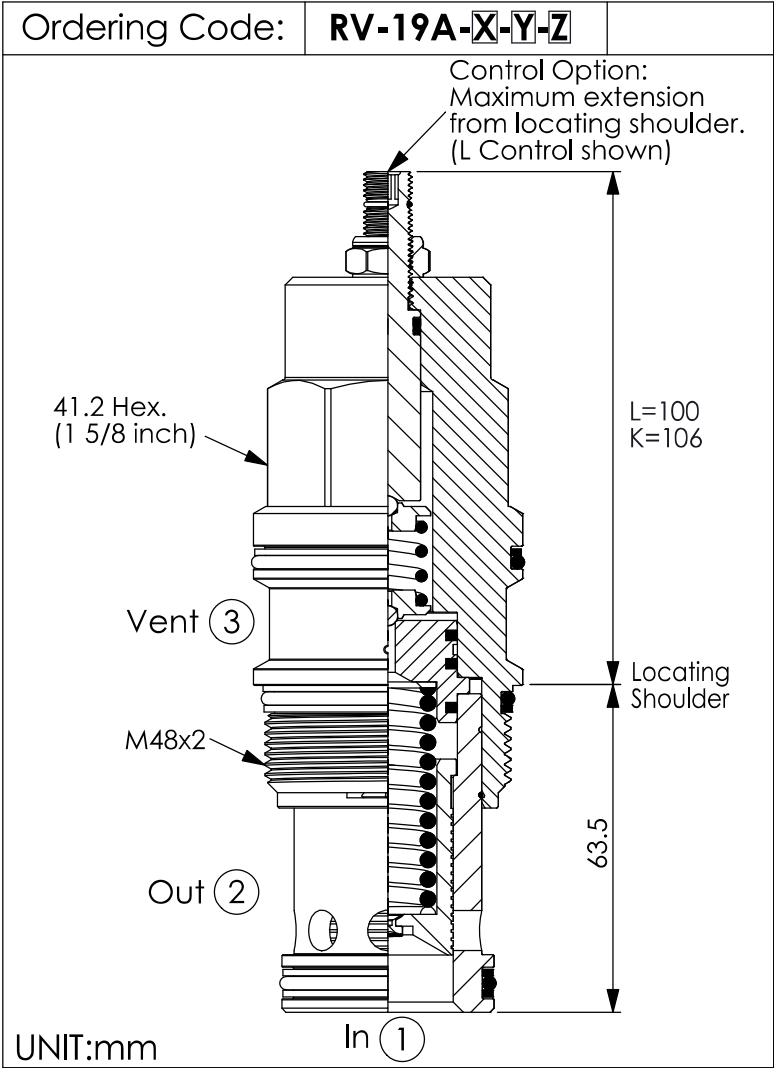
K Handknob with Lock Konb.



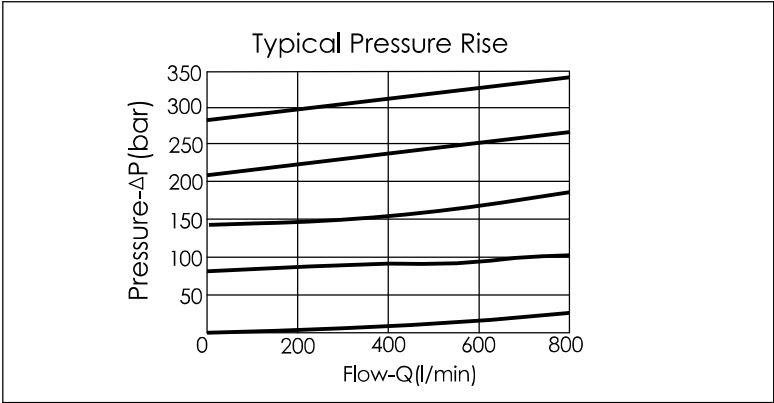
C Tamper Resistant Cover.



RELIEF VALVE
(Ventable)



TECHNICAL DATA		
Max.Operating pressure: 350 bar		
Rated flow:	480	l/min
Cavity-Tooling:	19A-3	
Installation torque:	465-500	Nm
Weight:	1.43	kg
Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.		



X	OPERATION	
30	Standard Type	

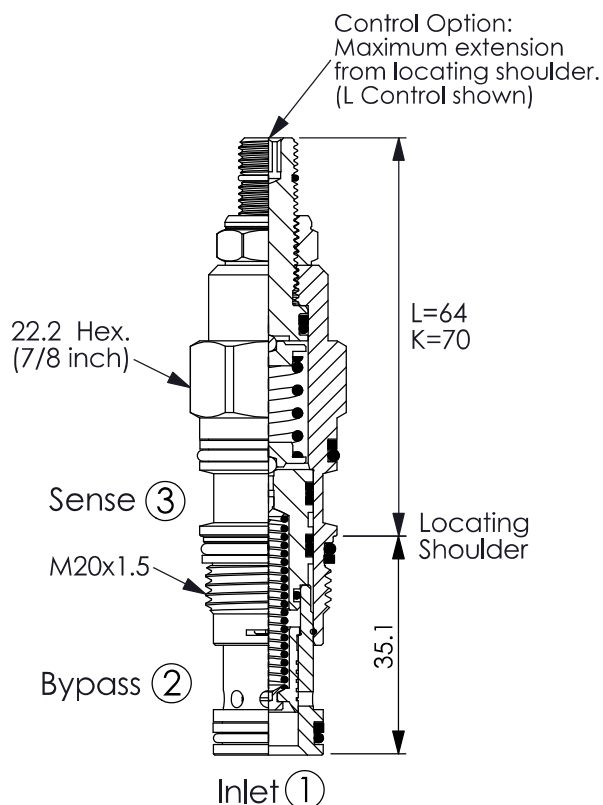
Y	SPRINGS	
	ADJUSTMENT RANGES	
A	7 to 210 bar	(70 bar Standard Setting)
B	3.5 to 105 bar	(70 bar Standard Setting)
C	10 to 420 bar	(70 bar Standard Setting)
D	1.7 to 55 bar	(14 bar Standard Setting)
H	2 to 210 bar	(70 bar Standard Setting)
W	10 to 315 bar	(70 bar Standard Setting)

Z	OPTIONS	
L	Leakproof hex. socket screw.	
K	Handknob with Lock Konb.	
C	Tamper Resistant Cover.	

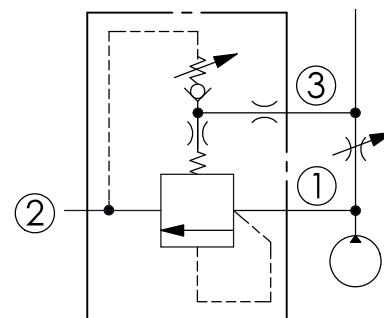
RELIEF VALVE

(Modulating Element With Relief Function)

Ordering Code: **RV-11A-X-Y-Z**



UNIT:mm



TECHNICAL DATA

Max.Operating pressure: 350 bar

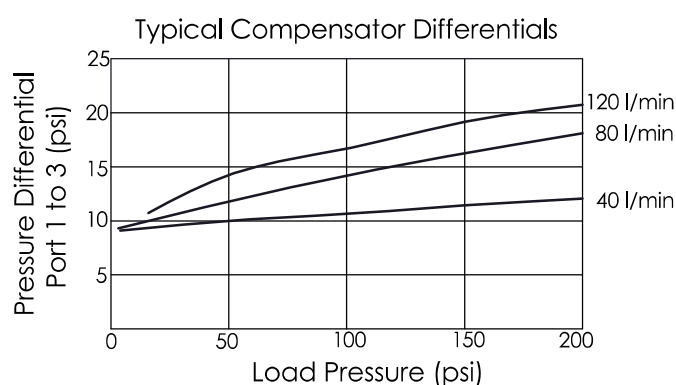
Rated flow: 40 l/min

Cavity-Tooling: 11A-3

Installation torque: 40-50 Nm

Weight: 0.15 kg

Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.



X OPERATION

3B Piston Without Orifice
Compensating Pressure is 7 bar

Y

SPRINGS

ADJUSTMENT RANGES

A 7 to 210 bar (70 bar Standard Setting)

B 3.5 to 105 bar (70 bar Standard Setting)

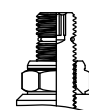
C 10 to 420 bar (70 bar Standard Setting)

W 10 to 315 bar (70 bar Standard Setting)

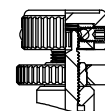
Z

OPTIONS

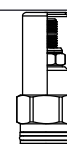
L Leakproof hex. socket screw.



K Handknob with Lock Konb.



C Tamper Resistant Cover.



RELIEF VALVE

(Modulating Element With Relief Function)

Ordering Code: **RV-2A-X-Y-Z**

Control Option:
Maximum extension
from locating shoulder.
(L Control shown)

28.5 Hex.
(1 1/8 inch)

Sense ③

1.00-14UNS-2A

Bypass ②

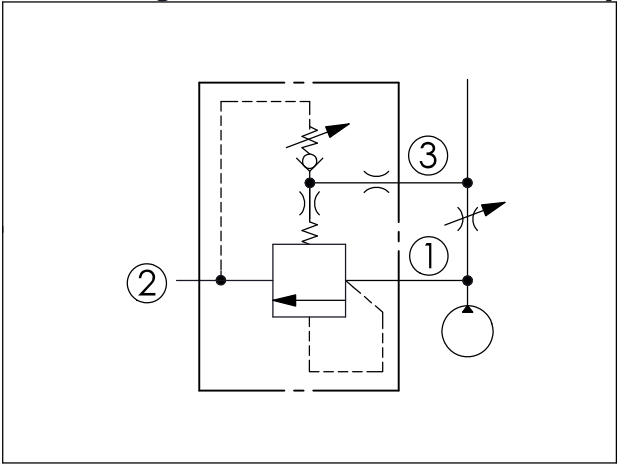
Inlet ①

L=71
K=78

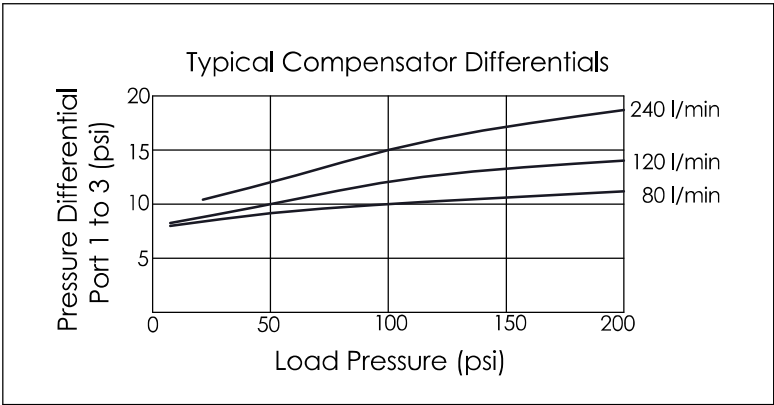
35.1

Locating Shoulder

UNIT:mm



TECHNICAL DATA		
Max.Operating pressure: 350 bar		
Rated flow:	80	l/min
Cavity-Tooling:	2A-3	
Installation torque:	60-70	Nm
Weight:	0.29	kg
Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.		



X	OPERATION	
3B	Piston Without Orifice	
	Compensating Pressure is 8 bar	

Y	SPRINGS	
	ADJUSTMENT RANGES	
A	7 to 210 bar (70 bar Standard Setting)	
B	3.5 to 105 bar (70 bar Standard Setting)	
C	10 to 420 bar (70 bar Standard Setting)	
W	10 to 315 bar (70 bar Standard Setting)	

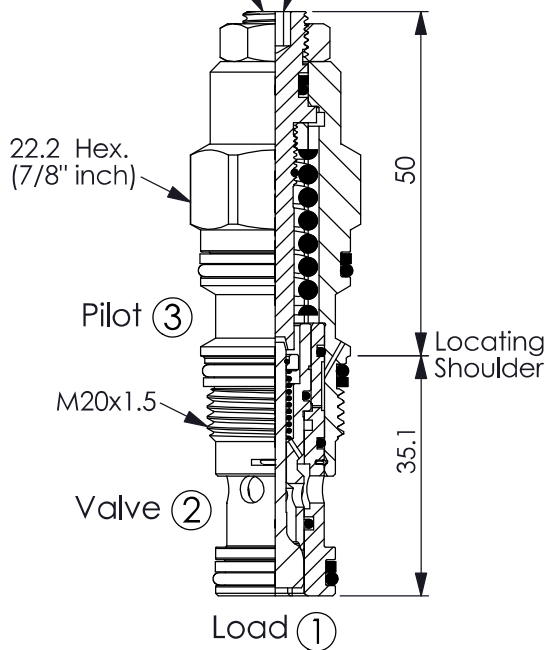
Z	OPTIONS	
L	Leakproof hex. socket screw.	
K	Handknob with Lock Konb.	
C	Tamper Resistant Cover.	

COUNTERBALANCE VALVE

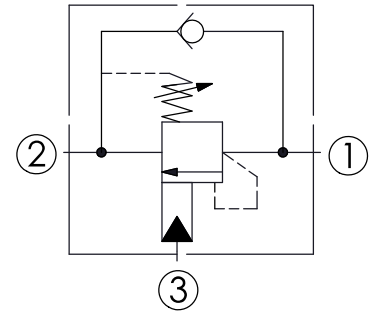
Ordering Code: **CB-11A-X-Y-Z**

Turn screw clockwise to reduce setting and release load. Complete adjustment range in 3 turns.

Control Option: Maximum extension from locating shoulder. (L Control shown)



UNIT:mm

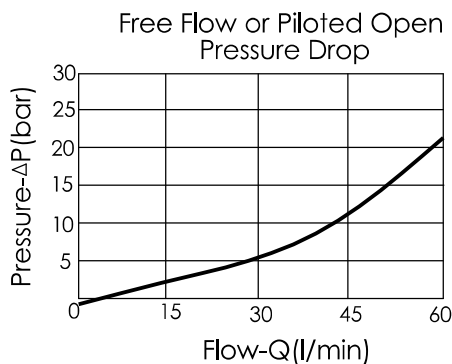


TECHNICAL DATA

Max. Setting:	280	bar
Rated flow:	60	l/min
Cavity-Tooling:	11A-3	
Installation torque:	40-50	Nm
Weight:	0.16	kg

Pressure Setting:

Setting should be 1.3 times maximum load induced pressure.



X PILOT RATIO

33	3 : 1	(Standard)
31	1.5 : 1	(Option)
3A	1.5 : 1	Port 3 with seals (Standard)
3C	3 : 1	Port 3 with seals (Option)

Y

SPRINGS

ADJUSTMENT RANGES(2 bar Cracking Pressure)

H	70 to 280 bar (210 bar Standard Setting)
I	25 to 105 bar (70 bar Standard Setting)
M	16 to 55 bar (25 bar Standard Setting)

SPECIAL PURPOSES(0.3 bar Cracking Pressure)

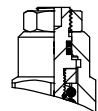
A	70 to 280 bar (210 bar Standard Setting)
B	25 to 105 bar (70 bar Standard Setting)

Z

OPTION

L

Leakproof hex. socket screw.

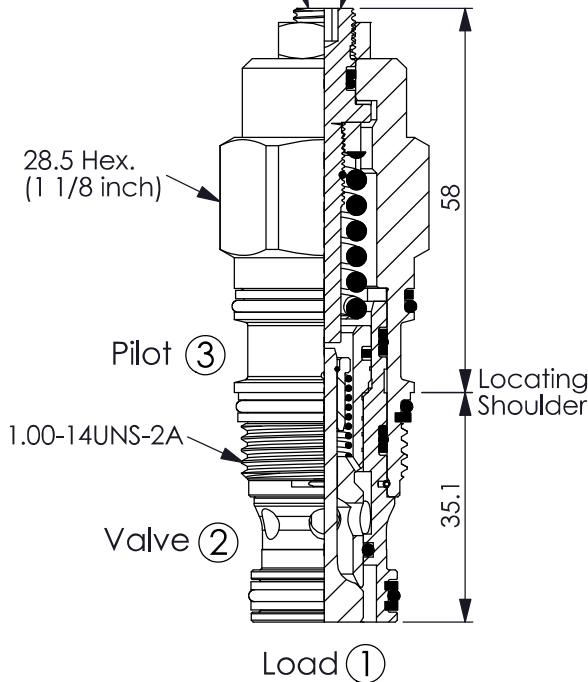


COUNTERBALANCE VALVE

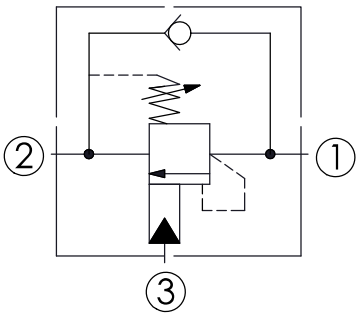
Ordering Code: **CB-2A-X-Y-Z**

Turn screw clockwise to reduce setting and release load.
Complete adjustment range in 3 turns.

Control Option:
Maximum extension from locating shoulder.
(L Control shown)



UNIT:mm



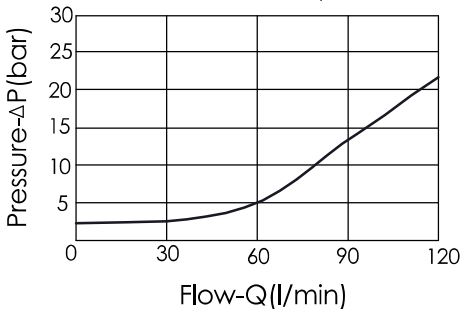
TECHNICAL DATA

Max. Setting:	280	bar
Rated flow:	120	l/min
Cavity-Tooling:	2A-3	
Installation torque:	60-70	Nm
Weight:	0.3	kg

Pressure Setting:

Setting should be 1.3 times maximum load induced pressure.

Free Flow or Piloted Open Pressure Drop



X

PILOT RATIO

33

3 : 1 (Standard)

31

1.5 : 1 (Option)

3A

1.5 : 1 Port 3 with seals (Standard)

3C

3 : 1 Port 3 with seals (Option)

Y

SPRINGS

ADJUSTMENT RANGES (2 bar Cracking Pressure)

H

70 to 280 bar (210 bar Standard Setting)

I

25 to 105 bar (70 bar Standard Setting)

SPECIAL PURPOSES (0.3 bar Cracking Pressure)

A

70 to 280 bar (210 bar Standard Setting)

B

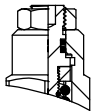
25 to 105 bar (70 bar Standard Setting)

Z

OPTION

L

Leakproof hex. socket screw.

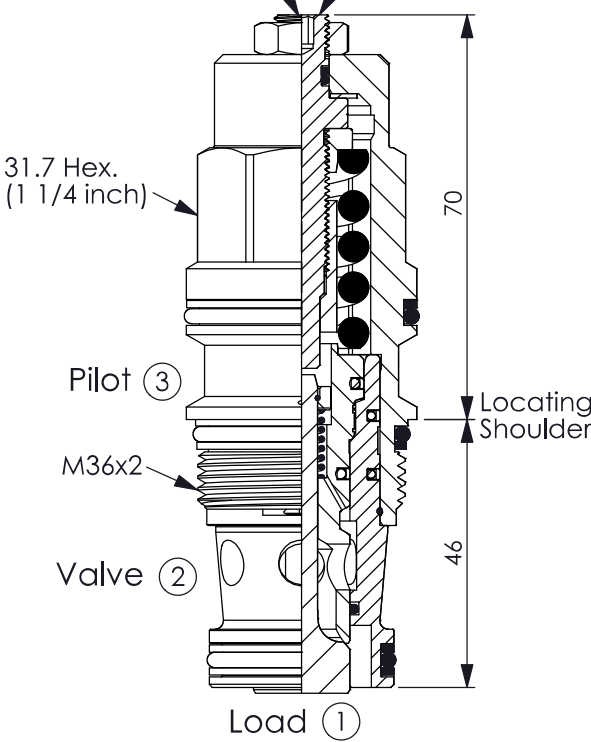


COUNTERBALANCE VALVE

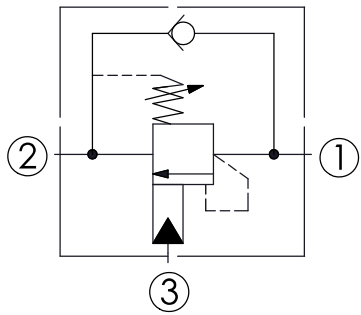
Ordering Code: **CB-17A-X-Y-Z**

Turn screw clockwise to reduce setting and release load. Complete adjustment range in 3 turns.

Control Option: Maximum extension from locating shoulder. (L Control shown)

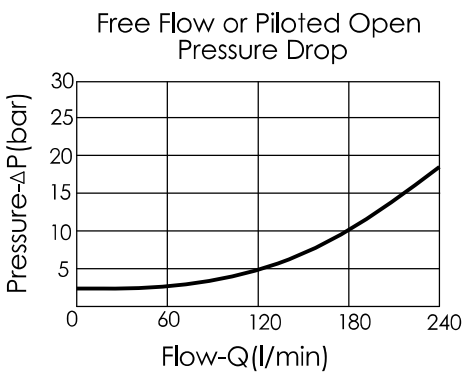


UNIT:mm



TECHNICAL DATA

Max. Setting:	280	bar
Rated flow:	240	l/min
Cavity-Tooling:	17A-3	
Installation torque:	200-215	Nm
Weight:	0.6	kg
Pressure Setting:		
Setting should be 1.3 times maximum load induced pressure.		



X	PILOT RATIO	
33	3 : 1	(Standard)
31	1.5 : 1	(Option)
3A	1.5 : 1	Port 3 with seals (Standard)
3C	3 : 1	Port 3 with seals (Option)

Y	SPRINGS	
	ADJUSTMENT RANGES(2 bar Cracking Pressure)	
H	70 to 280 bar	(210 bar Standard Setting)
I	25 to 105 bar	(70 bar Standard Setting)
	SPECIAL PURPOSES(0.3 bar Cracking Pressure)	
A	70 to 280 bar	(210 bar Standard Setting)
B	25 to 105 bar	(70 bar Standard Setting)

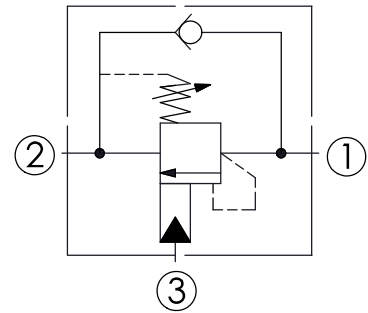
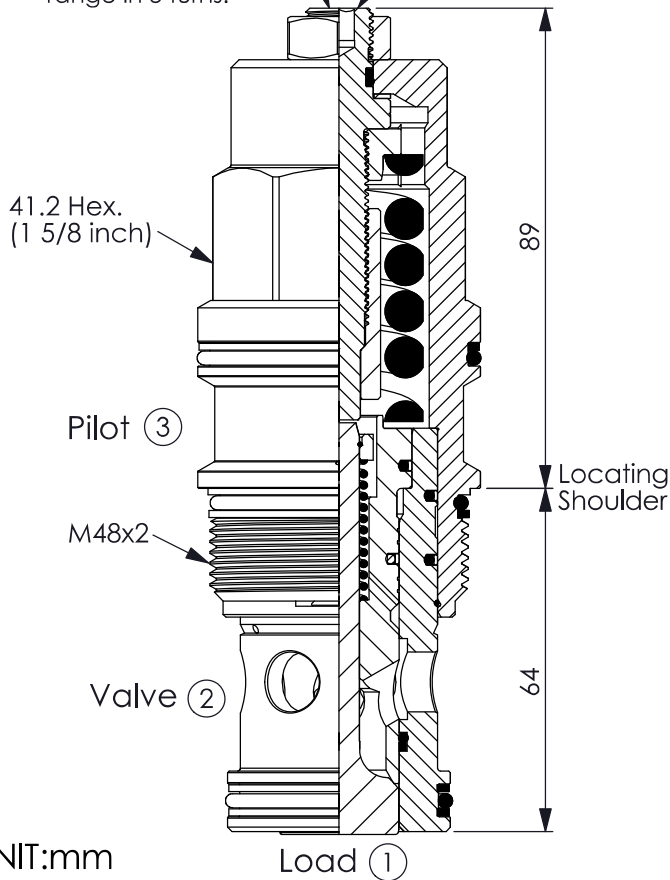
Z	OPTION	
L	Leakproof hex. socket screw.	

COUNTERBALANCE VALVE

Ordering Code: **CB-19A-X-Y-Z**

Turn screw clockwise to reduce setting and release load.
Complete adjustment range in 3 turns.

Control Option:
Maximum extension from locating shoulder.
(L Control shown)



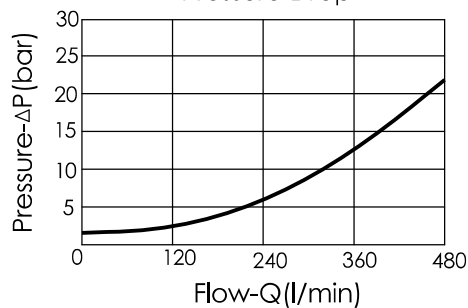
TECHNICAL DATA

Max. pressure:	280	bar
Rated flow:	480	l/min
Cavity-Tooling:	19A-3	
Installation torque:	465-500	Nm
Weight:	1.4	kg

Pressure Setting:

Setting should be at least 1.3 times the maximum load induced pressure.

Free Flow or Piloted Open Pressure Drop



X

PILOT RATIO

33	3 : 1	(Standard)
31	1.5 : 1	(Option)
3A	1.5 : 1	Port 3 with seals (Standard)
3C	3 : 1	Port 3 with seals (Option)

Y

SPRINGS

ADJUSTMENT RANGES (2 bar Cracking Pressure)

H 70 to 280 bar (210 bar Standard Setting)

I 25 to 105 bar (70 bar Standard Setting)

SPECIAL PURPOSES (0.3 bar Cracking Pressure)

A 70 to 280 bar (210 bar Standard Setting)

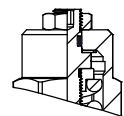
B 25 to 105 bar (70 bar Standard Setting)

Z

OPTION

L

Leakproof hex. socket screw.

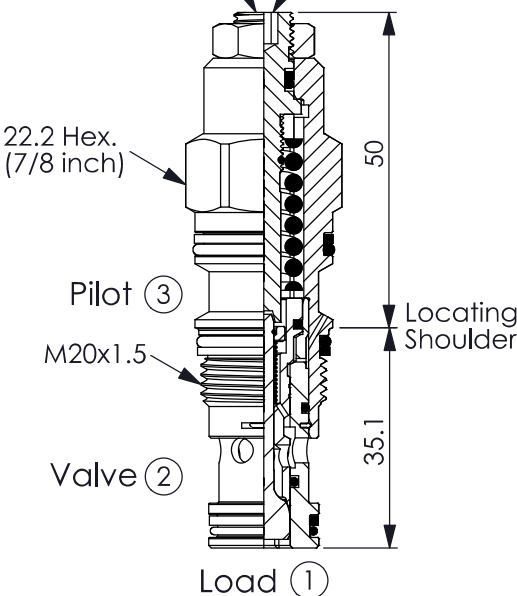


COUNTERBALANCE VALVE

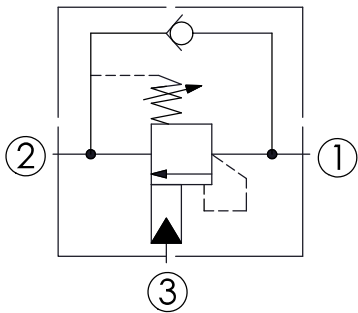
Ordering Code: **CB-11A-X-Y-Z**

Turn screw clockwise to reduce setting and release load. Complete adjustment range in 3 turns.

Control Option: Maximum extension from locating shoulder. (L Control shown)



UNIT:mm

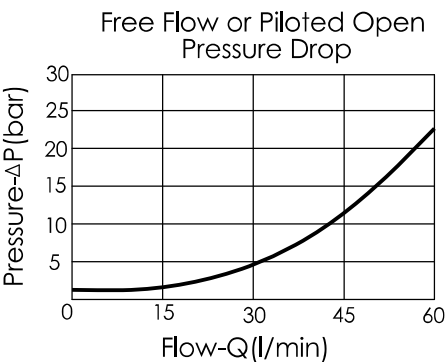


TECHNICAL DATA

Max. pressure:	350	bar
Rated flow:	60	l/min
Cavity-Tooling:	11A-3	
Installation torque:	40-50	Nm
Weight:	0.16	kg

Pressure Setting:

Setting should be at least 1.3 times the maximum load induced pressure.



X

PILOT RATIO

30

10 : 1

34

4.5 : 1

Y

SPRINGS

ADJUSTMENT RANGES (2 bar Cracking Pressure)

J

140 to 350 bar (210 bar Standard Setting)

K

70 to 175 bar (140 bar Standard Setting)

SPECIAL PURPOSES (0.3 bar Cracking Pressure)

C

140 to 350 bar (210 bar Standard Setting)

D

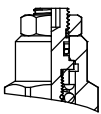
70 to 175 bar (140 bar Standard Setting)

Z

OPTION

L

Leakproof hex. socket screw.

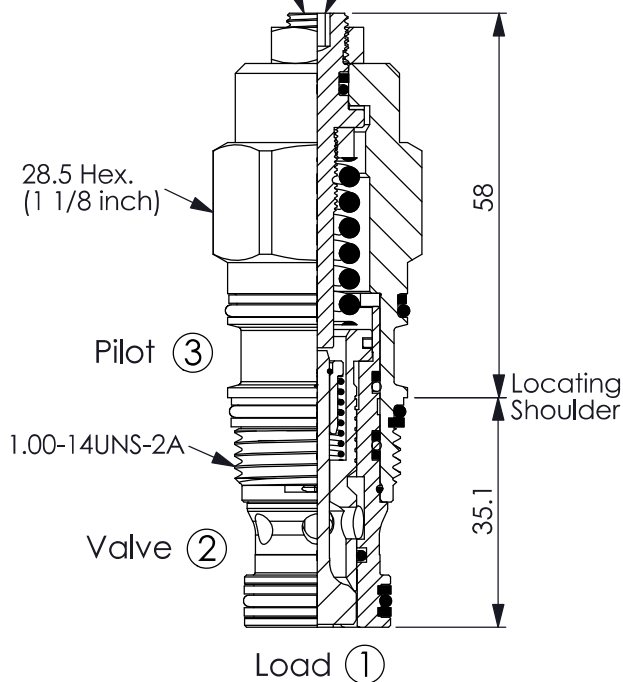


COUNTERBALANCE VALVE

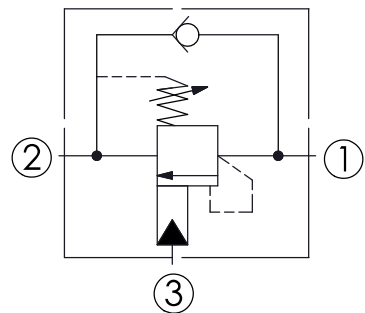
Ordering Code: **CB-2A-X-Y-Z**

Turn screw clockwise to reduce setting and release load. Complete adjustment range in 3 turns.

Control Option: Maximum extension from locating shoulder. (L Control shown)



UNIT:mm



TECHNICAL DATA

Max. pressure: 350 bar

Rated flow: 120 l/min

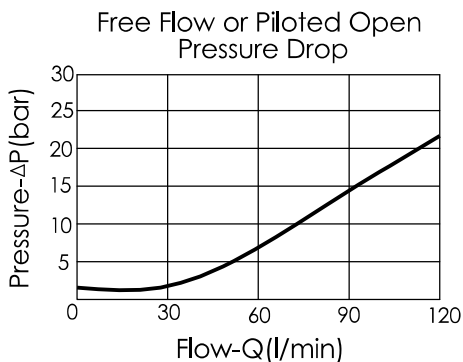
Cavity-Tooling: 2A-3

Installation torque: 60-70 Nm

Weight: 0.3 kg

Pressure Setting:

Setting should be at least 1.3 times the maximum load induced pressure.



X PILOT RATIO

30 10 : 1

34 4.5 : 1

Y SPRINGS

ADJUSTMENT RANGES (2 bar Cracking Pressure)

J 140 to 350 bar (210 bar Standard Setting)

K 70 to 175 bar (140 bar Standard Setting)

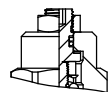
SPECIAL PURPOSES (0.3 bar Cracking Pressure)

C 140 to 350 bar (210 bar Standard Setting)

D 70 to 175 bar (140 bar Standard Setting)

Z OPTION

L Leakproof hex. socket screw.



COUNTERBALANCE VALVE

Ordering Code: **CB-17A-X-Y-Z**

Turn screw clockwise to reduce setting and release load.
Complete adjustment range in 3 turns.

Control Option:
Maximum extension from locating shoulder.
(L Control shown)

31.7 Hex.
(1 1/4 inch)

Pilot ③

M36x2

Valve ②

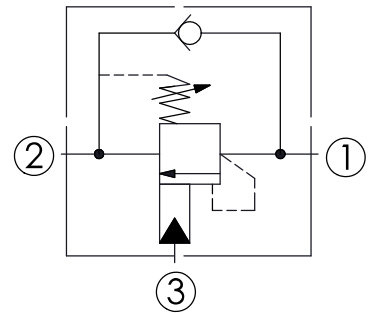
Load ①

70

46

Locating
Shoulder

UNIT:mm



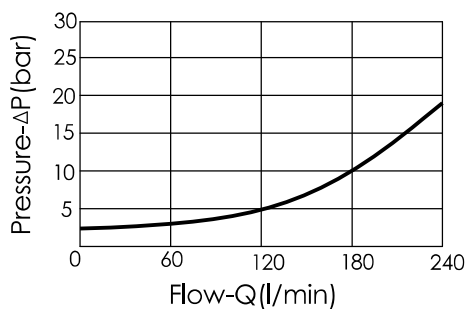
TECHNICAL DATA

Max. Setting:	350	bar
Rated flow:	240	l/min
Cavity-Tooling:	17A-3	
Installation torque:	200-215	Nm
Weight:	0.6	kg

Pressure Setting:

Setting should be 1.3 times maximum load induced pressure.

Free Flow or Piloted Open
Pressure Drop



X

PILOT RATIO

30

10 : 1

34

4.5 : 1

Y

SPRINGS

ADJUSTMENT RANGES(2 bar Cracking Pressure)

J

140 to 350 bar (210 bar Standard Setting)

K

70 to 175 bar (140 bar Standard Setting)

SPECIAL PURPOSES(0.3 bar Cracking Pressure)

C

140 to 350 bar (210 bar Standard Setting)

D

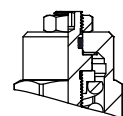
70 to 175 bar (140 bar Standard Setting)

Z

OPTION

L

Leakproof hex.
socket screw.



COUNTERBALANCE VALVE

Ordering Code: **CB-19A-X-Y-Z**

Turn screw clockwise to reduce setting and release load. Complete adjustment range in 3 turns.

Control Option: Maximum extension from locating shoulder. (L Control shown)

41.2 Hex. (1 5/8 inch)

Pilot ③

M48x2

Valve ②

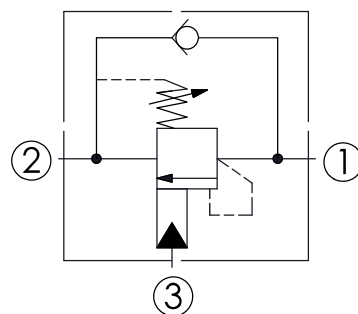
89

64

Locating Shoulder

Load ①

UNIT:mm



TECHNICAL DATA

Max. Setting: 350 bar

Rated flow: 480 l/min

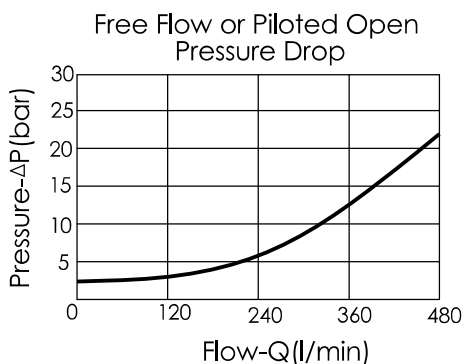
Cavity-Tooling: 19A-3

Installation torque: 465-500 Nm

Weight: 1.4 kg

Pressure Setting:

Setting should be 1.3 times maximum load induced pressure.



X

PILOT RATIO

30

10 : 1

34

4.5 : 1

Y

SPRINGS

ADJUSTMENT RANGES(2 bar Cracking Pressure)

J

140 to 350 bar (210 bar Standard Setting)

K

70 to 175 bar (140 bar Standard Setting)

SPECIAL PURPOSES(0.3 bar Cracking Pressure)

C

140 to 350 bar (210 bar Standard Setting)

D

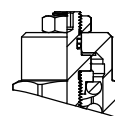
70 to 175 bar (140 bar Standard Setting)

Z

OPTION

L

Leakproof hex. socket screw.



COUNTERBALANCE VALVE

(Without Pilot Assist, 3 Port Cavity)

Ordering Code: **CB-11A-X-Y-Z**

Turn screw clockwise to reduce setting and release load.
Complete adjustment range in 3 turns.

Control Option:
Maximum extension from locating shoulder.
(L Control shown)

22.2 Hex.
(7/8" inch)

Pilot ③

M20x1.5

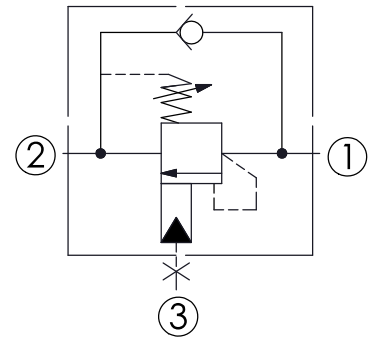
Valve ②

Load ①

50

Locating Shoulder

35.1



TECHNICAL DATA

Max. Setting: 280 bar

Rated flow: 60 l/min

Cavity-Tooling: 11A-3

Installation torque: 40-50 Nm

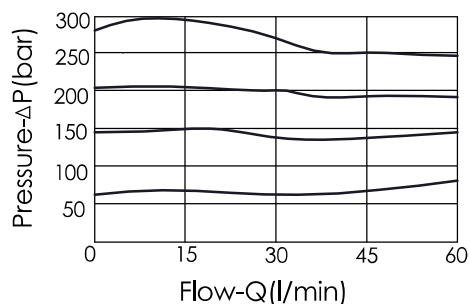
Weight: 0.15 kg

Pressure Setting:

Setting should be 1.3 times maximum load induced pressure.

UNIT:mm

Typical Relief Characteristics



X

PILOT RATIO

23

Without Pilot Assist,
3 Port Cavity

Y

SPRINGS

ADJUSTMENT RANGES (2 bar Cracking Pressure)

H

70 to 280 bar (210 bar Standard Setting)

I

25 to 105 bar (70 bar Standard Setting)

SPECIAL PURPOSES (0.3 bar Cracking Pressure)

A

70 to 280 bar (210 bar Standard Setting)

B

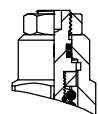
25 to 105 bar (70 bar Standard Setting)

Z

OPTION

L

Leakproof hex.
socket screw.



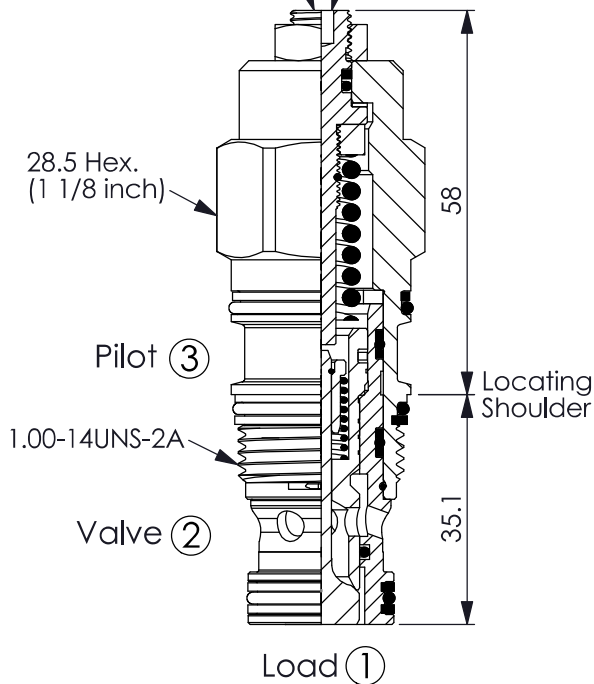
COUNTERBALANCE VALVE

(Without Pilot Assist, 3 Port Cavity)

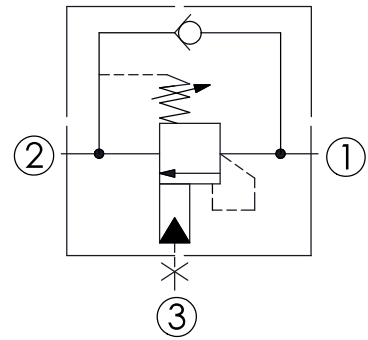
Ordering Code: **CB-2A-X-Y-Z**

Turn screw clockwise to reduce setting and release load. Complete adjustment range in 3 turns.

Control Option: Maximum extension from locating shoulder. (L Control shown)



UNIT:mm



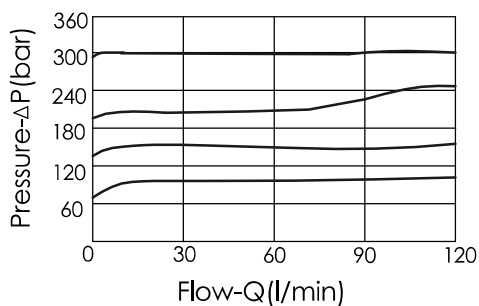
TECHNICAL DATA

Max. Setting:	280	bar
Rated flow:	120	l/min
Cavity-Tooling:	2A-3	
Installation torque:	60-70	Nm
Weight:	0.29	kg

Pressure Setting:

Setting should be 1.3 times maximum load induced pressure.

Typical Relief Characteristics



X PILOT RATIO

23 Without Pilot Assist, 3 Port Cavity

Y SPRINGS

ADJUSTMENT RANGES (2 bar Cracking Pressure)

H 70 to 280 bar (210 bar Standard Setting)

I 25 to 105 bar (70 bar Standard Setting)

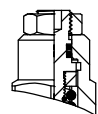
SPECIAL PURPOSES (0.3 bar Cracking Pressure)

A 70 to 280 bar (210 bar Standard Setting)

B 25 to 105 bar (70 bar Standard Setting)

Z OPTION

L Leakproof hex. socket screw.



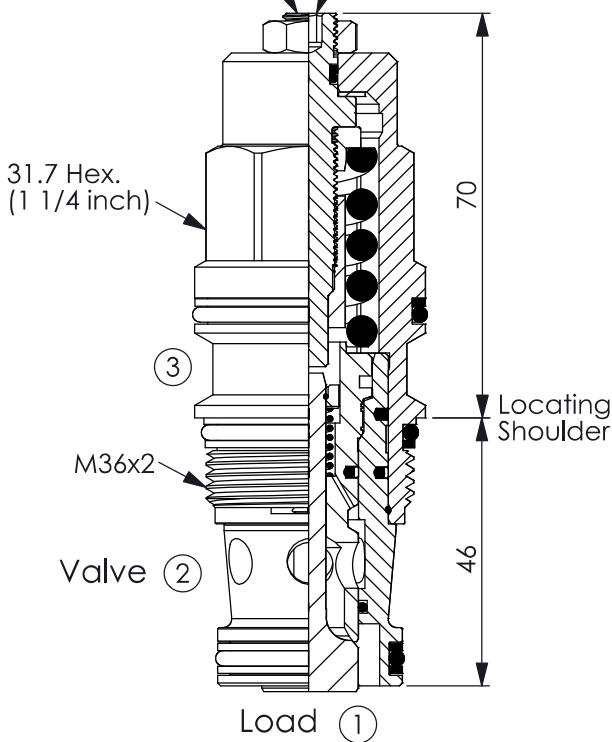
COUNTERBALANCE VALVE

(Without Pilot Assist, 3 Port Cavity)

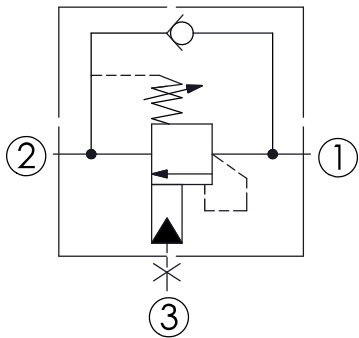
Ordering Code: **CB-17A-X-Y-Z**

Turn screw clockwise to reduce setting and release load. Complete adjustment range in 3 turns.

Control Option: Maximum extension from locating shoulder. (L Control shown)



UNIT:mm



TECHNICAL DATA

Max. Setting: 280 bar

Rated flow: 240 l/min

Cavity-Tooling: 17A-3

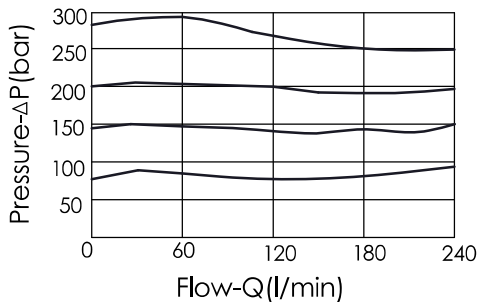
Installation torque: 200-215 Nm

Weight: 0.6 kg

Pressure Setting:

Setting should be 1.3 times maximum load induced pressure.

Typical Relief Characteristics



X

PILOT RATIO

23

Without Pilot Assist, 3 Port Cavity

Y

SPRINGS

ADJUSTMENT RANGES (2 bar Cracking Pressure)

H

70 to 280 bar (210 bar Standard Setting)

I

25 to 105 bar (70 bar Standard Setting)

SPECIAL PURPOSES (0.3 bar Cracking Pressure)

A

70 to 280 bar (210 bar Standard Setting)

B

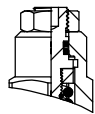
25 to 105 bar (70 bar Standard Setting)

Z

OPTION

L

Leakproof hex. socket screw.

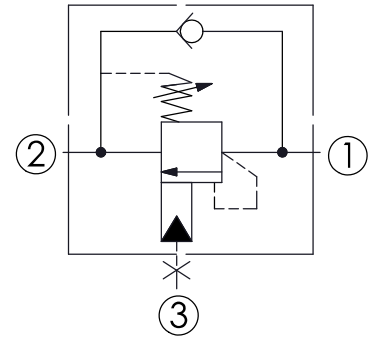
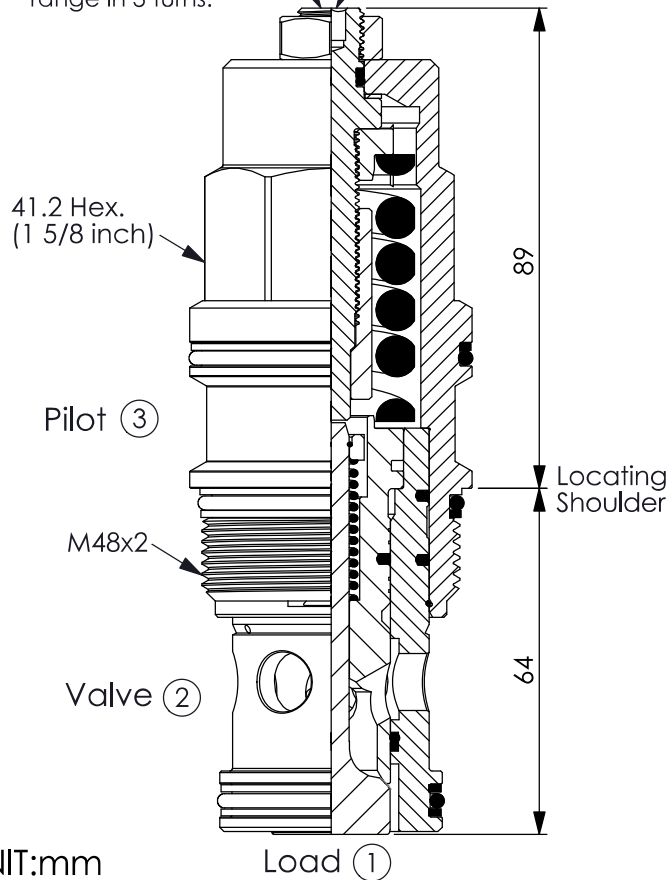


COUNTERBALANCE VALVE

Ordering Code: **CB-19A-X-Y-Z**

Turn screw clockwise to reduce setting and release load. Complete adjustment range in 3 turns.

Control Option: Maximum extension from locating shoulder. (L Control shown)

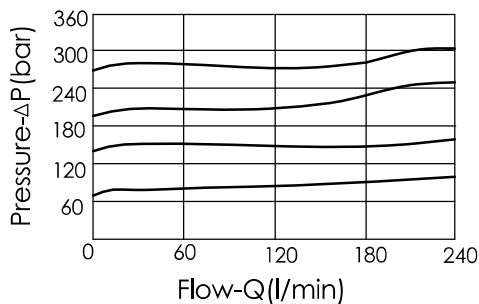


TECHNICAL DATA

Max. Setting:	280	bar
Rated flow:	480	l/min
Cavity-Tooling:	19A-3	
Installation torque:	465-500	Nm
Weight:	1.36	kg
Pressure Setting:		

Setting should be 1.3 times maximum load induced pressure.

Typical Relief Characteristics



X PILOT RATIO

23 Without Pilot Assist, 3 Port Cavity

Y SPRINGS

ADJUSTMENT RANGES (2 bar Cracking Pressure)

H 70 to 280 bar (210 bar Standard Setting)

I 25 to 105 bar (70 bar Standard Setting)

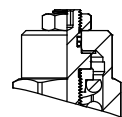
SPECIAL PURPOSES (0.3 bar Cracking Pressure)

A 70 to 280 bar (210 bar Standard Setting)

B 25 to 105 bar (70 bar Standard Setting)

Z OPTION

L Leakproof hex. socket screw.



COUNTERBALANCE VALVE

(Restrictive 280 Bar Maximum Setting)

Ordering Code:
 CB-11A-X-Y-Z-20

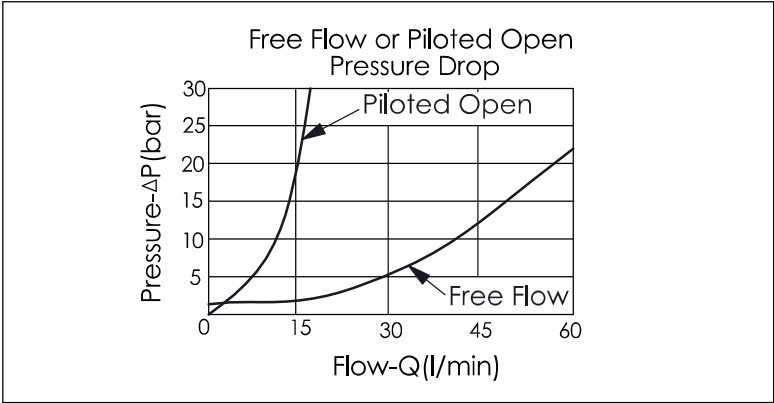
Turn screw clockwise to reduce setting and release load.
 Complete adjustment range in 3 turns.

Control Option:
 Maximum extension from locating shoulder.
 (L Control shown)

UNIT:mm

TECHNICAL DATA

Max. Setting:	280	bar
Rated flow:	20 l/min From Port 1to2	60 l/min From Port 2to1
Cavity-Tooling:	11A-3	
Installation torque:	40-50	Nm
Weight:	0.16	kg
Pressure Setting:	Setting should be 1.3 times maximum load induced pressure.	



X	PILOT RATIO	
3C	3 : 1	Port 3 with seals

Y	SPRINGS	
	ADJUSTMENT RANGES(2 bar Cracking Pressure)	
H	70 to 280 bar	(210 bar Standard Setting)
I	25 to 105 bar	(70 bar Standard Setting)
M	16 to 55 bar	(25 bar Standard Setting)
	SPECIAL PURPOSES(0.3 bar Cracking Pressure)	
A	70 to 280 bar	(210 bar Standard Setting)
B	25 to 105 bar	(70 bar Standard Setting)

Z	OPTION	
L	Leakproof hex. socket screw.	

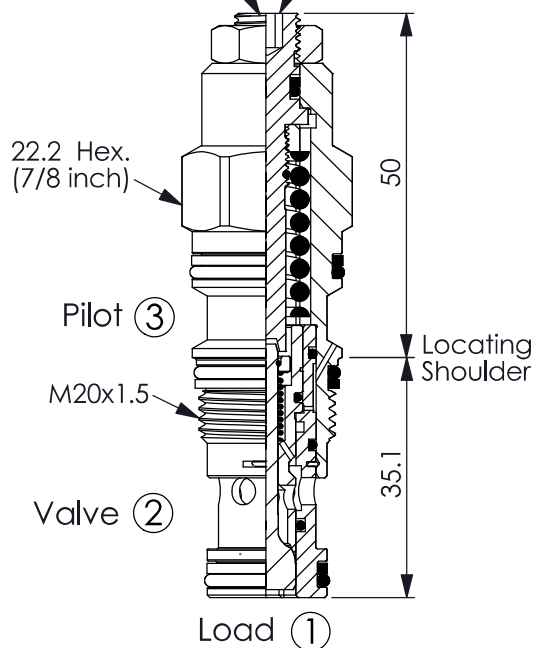
COUNTERBALANCE VALVE

(With Stainless Steel External Components)

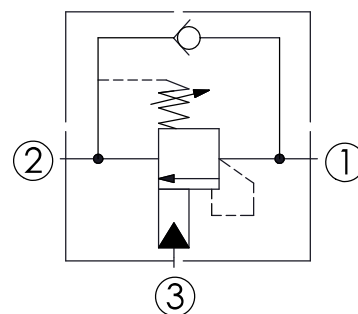
Ordering Code: **CB-11A-X-Y-Z-P**

Turn screw clockwise to reduce setting and release load.
Complete adjustment range in 3 turns.

Control Option:
Maximum extension from locating shoulder.
(L Control shown)



UNIT:mm

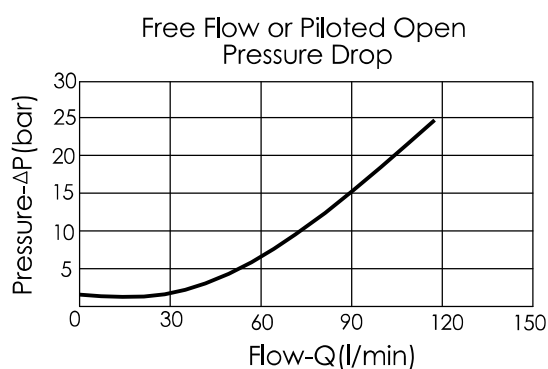


TECHNICAL DATA

Max. Setting:	280	bar
Rated flow:	60	l/min
Cavity-Tooling:	11A-3	
Installation torque:	40-50	Nm
Weight:	0.16	kg

Pressure Setting:

Setting should be 1.3 times maximum load induced pressure.



X PILOT RATIO

33	3 : 1	(Standard)
31	1.5 : 1	(Option)
3A	3 : 1	Port 3 with seals (Standard)
3C	1.5 : 1	Port 3 with seals (Option)

Y

SPRINGS

ADJUSTMENT RANGES(2 bar Cracking Pressure)

H

70 to 280 bar (210 bar Standard Setting)

I

25 to 105 bar (70 bar Standard Setting)

SPECIAL PURPOSES(0.3 bar Cracking Pressure)

A

70 to 280 bar (210 bar Standard Setting)

B

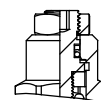
25 to 105 bar (70 bar Standard Setting)

Z

OPTION

L

Leakproof hex. socket screw.



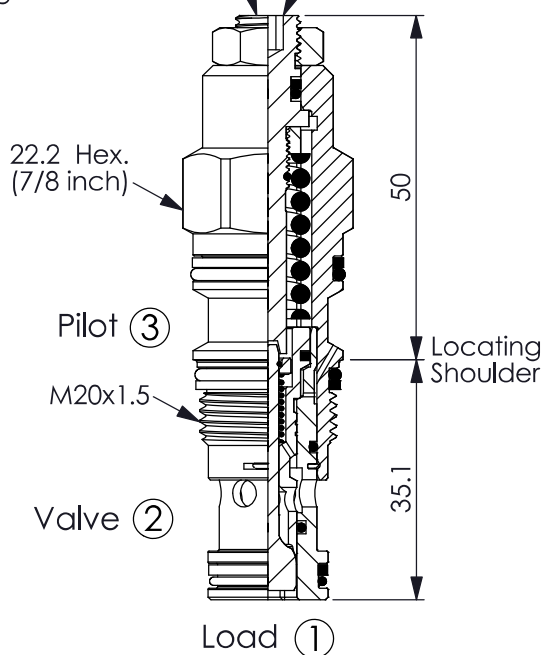
COUNTERBALANCE VALVE

(With Stainless Steel External Components)

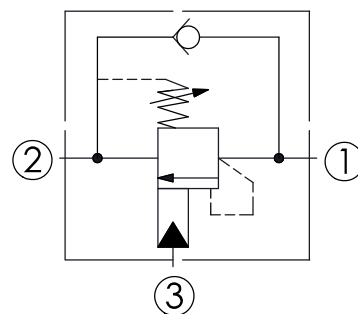
Ordering Code: **CB-11A-X-Y-Z-P**

Turn screw clockwise to reduce setting and release load. Complete adjustment range in 3 turns.

Control Option: Maximum extension from locating shoulder. (L Control shown)



UNIT:mm



TECHNICAL DATA

Max. Setting: 350 bar

Rated flow: 60 l/min

Cavity-Tooling: 11A-3

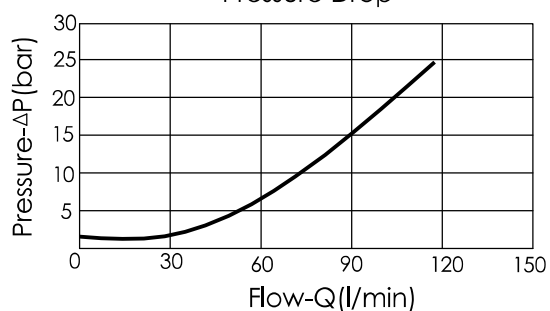
Installation torque: 40-50 Nm

Weight: 0.16 kg

Pressure Setting:

Setting should be 1.3 times maximum load induced pressure.

Free Flow or Piloted Open Pressure Drop



X

PILOT RATIO

30

10 : 1

34

4.5 : 1

Y

SPRINGS

ADJUSTMENT RANGES(2 bar Cracking Pressure)

J

140 to 350 bar (210 bar Standard Setting)

K

70 to 175 bar (140 bar Standard Setting)

SPECIAL PURPOSES(0.3 bar Cracking Pressure)

C

140 to 350 bar (210 bar Standard Setting)

D

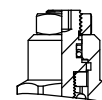
70 to 175 bar (140 bar Standard Setting)

Z

OPTION

L

Leakproof hex. socket screw.

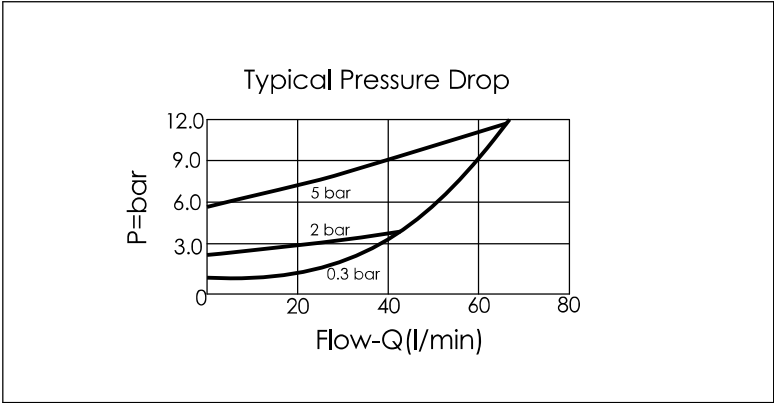


CHECK VALVE

Ordering Code: **CV-13A-X-Y-Z**

UNIT:mm

TECHNICAL DATA		
Max. pressure:	350	bar
Rated flow:	80	l/min
Cavity-Tooling:	13A-2	
Installation torque:	40-50	Nm
Weight:	0.10	kg



X	OPERATION	
20	1 to 2 (Free Flow)	

Y	SPRINGS	
	Cracking pressure	
03	0.3 bar	
10	1.0 bar	
20	2.0 bar	
35	3.5 bar	
50	5.0 bar	
70	7.0 bar	

Z	OPTION	
N	Non-adjustable	

CHECK VALVE

Ordering Code: **CV-5A-X-Y-Z**

28.5 Hex.
(1 1/8 inch)

1.00-14UNS-2A

Maximum Extension
from Locating Shoulder.

17.5

Locating
Shoulder

41.1

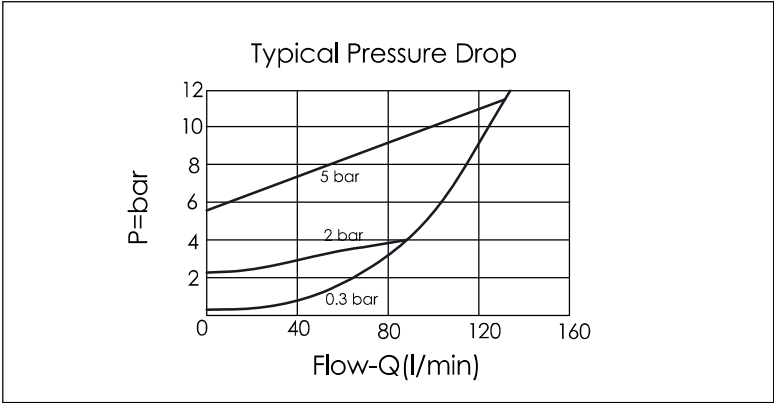
Out ②

In ①

UNIT:mm

① → ②

TECHNICAL DATA		
Max. pressure:	350	bar
Rated flow:	160	l/min
Cavity-Tooling:	5A-2	
Installation torque:	60-70	Nm
Weight:	0.20	kg



X	OPERATION	
20	1 to 2 (Free Flow)	

Y	SPRINGS	
	Cracking pressure	
03	0.3 bar	
10	1.0 bar	
20	2.0 bar	
35	3.5 bar	
50	5.0 bar	
70	7.0 bar	

Z	OPTION	
N	Non-adjustable	

CHECK VALVE

Ordering Code: **CV-16A-X-Y-Z**

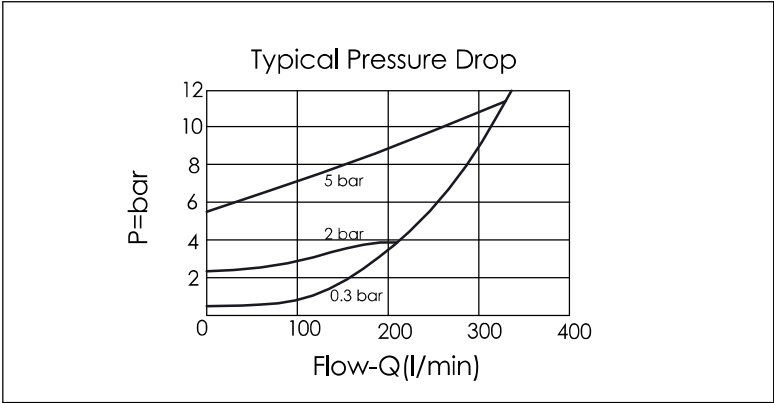
Technical drawing of the check valve assembly. The drawing shows a cross-section of the valve with the following labels and dimensions:

- 31.7 Hex. (1 1/4 inch)
- M36x2
- Maximum Extension from Locating Shoulder.
- 25
- Locating Shoulder
- 62
- Out ②
- In ①

UNIT:mm

Schematic diagram of the check valve showing flow direction from 1 to 2.

TECHNICAL DATA		
Max. pressure:	350	bar
Rated flow:	320	l/min
Cavity-Tooling:	16A-2	
Installation torque:	200-215	Nm
Weight:	0.42	kg



X	OPERATION	
20	1 to 2 (Free Flow)	

Y	SPRINGS	
	Cracking pressure	
03	0.3 bar	
10	1.0 bar	
20	2.0 bar	
35	3.5 bar	
50	5.0 bar	
70	7.0 bar	

Z	OPTION	
N	Non-adjustable	

CHECK VALVE

Ordering Code: **CV-18A-X-Y-Z**

41.2 Hex.
(1 5/8 inch)

Maximum Extension
from Locating Shoulder.

30

M48x2

Locating
Shoulder

79.5

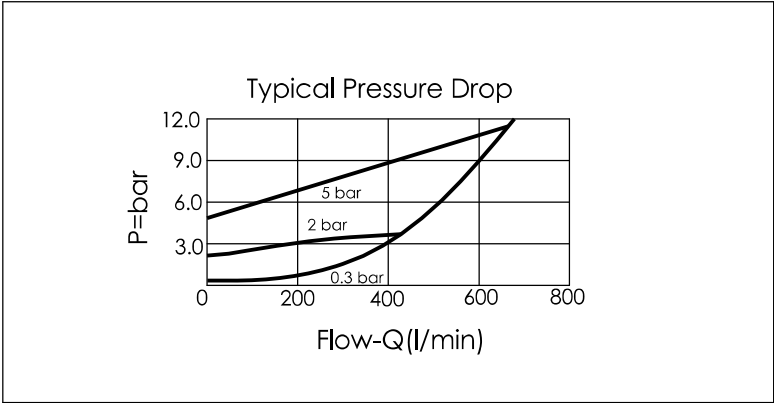
Out ②

In ①

UNIT:mm

① ②

TECHNICAL DATA		
Max. pressure:	350	bar
Rated flow:	640	l/min
Cavity-Tooling:	18A-2	
Installation torque:	465-500	Nm
Weight:	0.95	kg



X	OPERATION	
20	1 to 2 (Free Flow)	

Y	SPRINGS	
	Cracking pressure	
03	0.3 bar	
10	1.0 bar	
20	2.0 bar	
35	3.5 bar	
50	5.0 bar	
70	7.0 bar	

Z	OPTION	
N	Non-adjustable	

CHECK VALVE

Ordering Code: **CV-08W-X-Y-Z**

22.2 Hex.
(7/8 inch)

3/4"-16UNF-2A

Out ②

In ①

Locating Shoulder

Maximum Extension from Locating Shoulder.

8.0

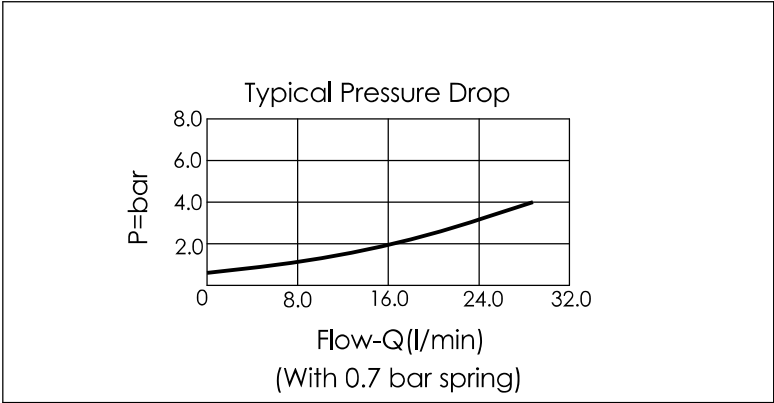
28

UNIT:mm

①

②

TECHNICAL DATA		
Max. pressure:	240	bar
Rated flow:	30	l/min
Cavity-Tooling:	08W-2	
Installation torque:	25-35	Nm
Weight:	0.05	kg



X	OPERATION	
20	1 to 2 (Free Flow)	

Y	SPRINGS	
	Cracking pressure	
03	0.3 bar	
07	0.7 bar	
17	1.7 bar	
41	4.1 bar	
69	6.9 bar	
103	10.3 bar	
138	13.8 bar	
176	17.6 bar	

Z	OPTION	
N	Non-adjustable	

CHECK VALVE

Ordering Code: **CV-10W-X-Y-Z**

25.4 Hex.
(1 inch)

7/8"-14UNF-2A

Maximum Extension
from Locating Shoulder.

Locating
Shoulder

8.0

32

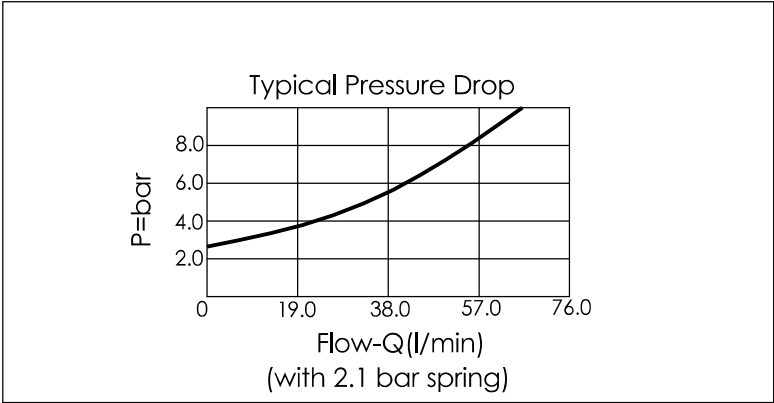
Out ②

In ①

UNIT:mm

① → ②

TECHNICAL DATA		
Max. pressure:	240	bar
Rated flow:	60	l/min
Cavity-Tooling:	10W-2	
Installation torque:	35-45	Nm
Weight:	0.08	kg



X	OPERATION	
20	1 to 2 (Free Flow)	

Y	SPRINGS	
	Cracking pressure	
03	0.3 bar	
21	2.1 bar	
41	4.1 bar	

Z	OPTION	
N	Non-adjustable	

CHECK VALVE

Ordering Code: **CV-12W-X-Y-Z**

32.0 Hex.

1-1/16"-12UN-2A

Maximum Extension from Locating Shoulder.

9.5

Locating Shoulder

45

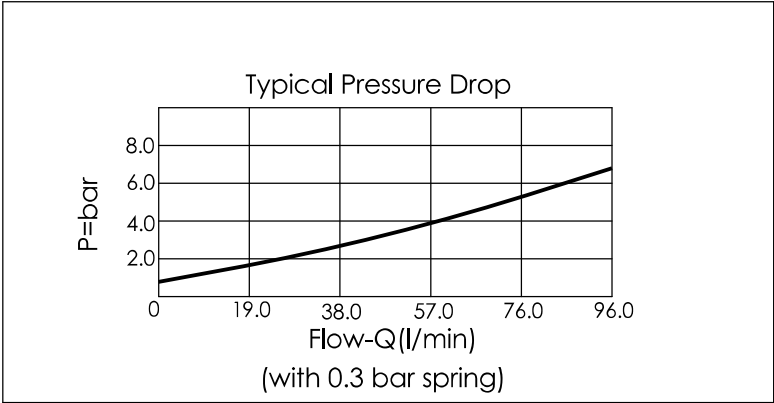
Out ②

In ①

UNIT:mm

① ②

TECHNICAL DATA		
Max. pressure:	240	bar
Rated flow:	90	l/min
Cavity-Tooling:	12W-2	
Installation torque:	45-55	Nm
Weight:	0.17	kg



X	OPERATION	
20	1 to 2 (Free Flow)	

Y	SPRINGS	
	Cracking pressure	
03	0.3 bar	
17	1.7 bar	
41	4.1 bar	

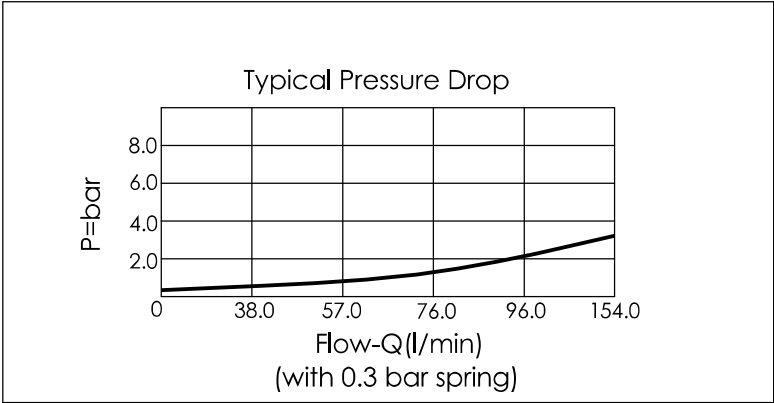
Z	OPTION	
N	Non-adjustable	

CHECK VALVE

Ordering Code: **CV-16W-X-Y-Z**

UNIT:mm

TECHNICAL DATA		
Max. pressure:	240	bar
Rated flow:	150	l/min
Cavity-Tooling:	16W-2	
Installation torque:	60-70	Nm
Weight:	0.27	kg



X	OPERATION	
20	1 to 2 (Free Flow)	

Y	SPRINGS	
	Cracking pressure	
03	0.3 bar	
17	1.7 bar	
41	4.1 bar	

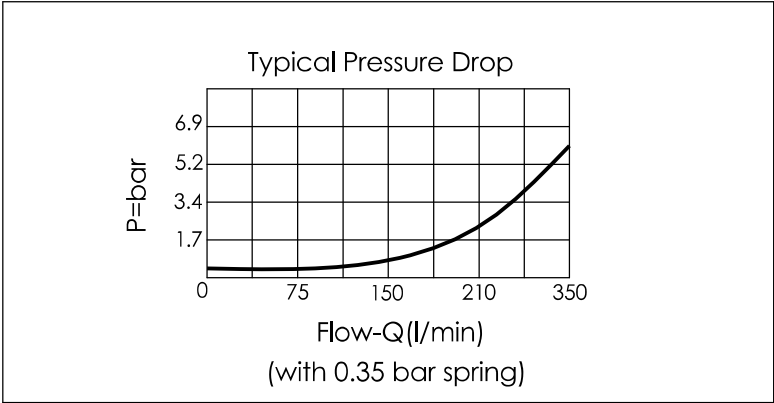
Z	OPTION	
N	Non-adjustable	

CHECK VALVE

Ordering Code: **CV-42W-X-Y-Z**

UNIT:mm

TECHNICAL DATA		
Max. pressure:	240	bar
Rated flow:	350	l/min
Cavity-Tooling:	42W-2	
Installation torque:	110-130	Nm
Weight:	0.6	kg



X	OPERATION	
20	1 to 2 (Free Flow)	

Y	SPRINGS	
	Cracking pressure	
03	0.3 bar	
17	1.7 bar	
21	2.1 bar	
41	4.1 bar	

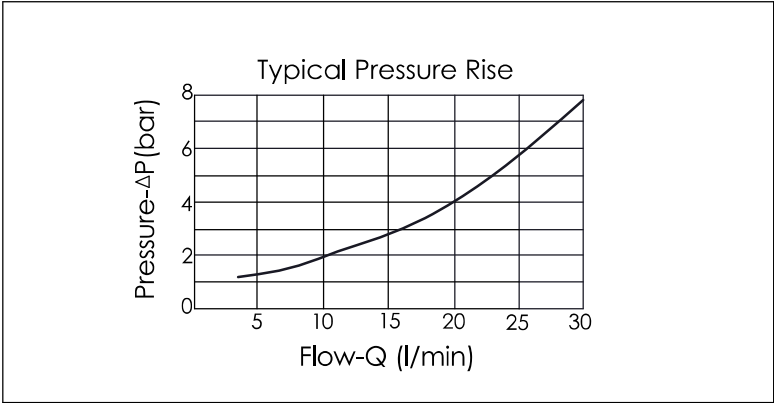
Z	OPTION	
N	Non-adjustable	

CHECK VALVE

Ordering Code: **CV-08W-X-Y-Z**

UNIT:mm

TECHNICAL DATA		
Max. pressure:	350	bar
Rated flow:	30	l/min
Cavity-Tooling:	08W-2	
Installation torque:	25-35	Nm
Weight:	0.1	kg



X	OPERATION	
22	1 to 2 (Free Flow)	

Y	SPRINGS	
	Cracking pressure	
10	1.0 bar	

Z	OPTION	
N	Non-adjustable	

CHECK VALVE

Ordering Code: **CV-17E-X-Y-Z**

32.0 Hex.

G 3/4"

Out ②

In ①

Maximum Extension from Locating Shoulder.

19

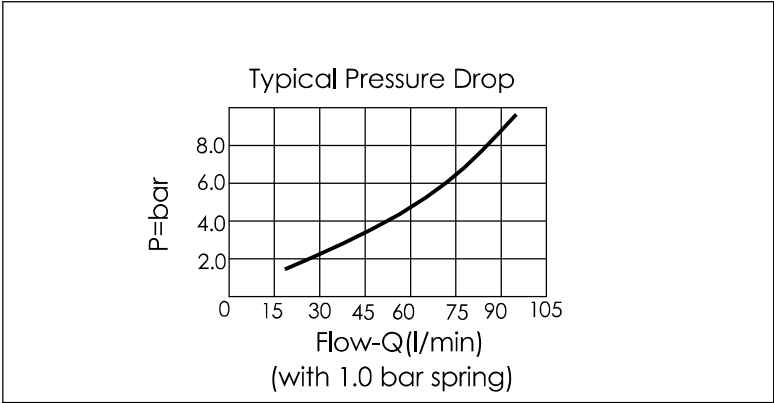
Locating Shoulder

38

UNIT:mm

① → ②

TECHNICAL DATA		
Max. pressure:	350	bar
Rated flow:	60	l/min
Cavity-Tooling:	17E-2	
Installation torque:	45-55	Nm
Weight:	0.19	kg



X	OPERATION	
22	1 to 2 (Free Flow)	

Y	SPRINGS	
	Cracking pressure	
03	0.3 bar	
10	1.0 bar	
50	5.0 bar	

Z	OPTION	
N	Non-adjustable	

CHECK VALVE

Ordering Code: **CV-21E-X-Y-Z**

38.0 Hex.

G 1"

Out ②

In ①

Maximum Extension from Locating Shoulder.

16

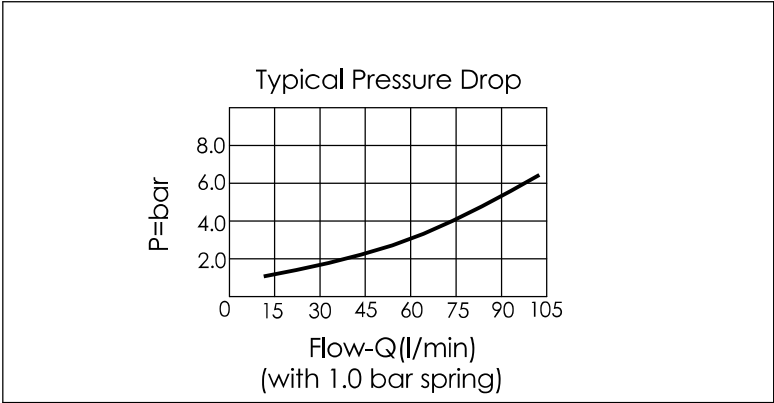
Locating Shoulder

48

UNIT:mm

① → ②

TECHNICAL DATA		
Max. pressure:	350	bar
Rated flow:	100	l/min
Cavity-Tooling:	21E-2	
Installation torque:	70-90	Nm
Weight:	0.3	kg



X	OPERATION	
22	1 to 2 (Free Flow)	

Y	SPRINGS	
	Cracking pressure	
10	1.0 bar	
50	5.0 bar	

Z	OPTION	
N	Non-adjustable	

CHECK VALVE

(Free flow side to nose check valve)

Ordering Code: **CV-13A-X-Y-Z**

22.2 Hex.
(7/8 inch)

M20x1.5

In ②

Out ①

Maximum Extension
from Locating Shoulder.

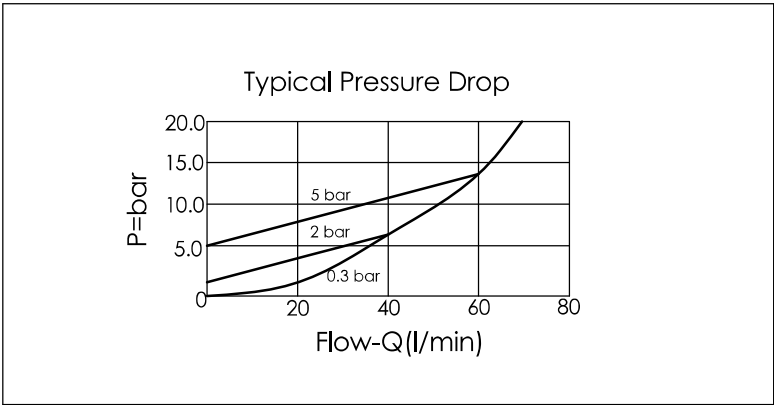
19

35.1

Locating
Shoulder

UNIT:mm

TECHNICAL DATA		
Max. pressure:	350	bar
Rated flow:	60	l/min
Cavity-Tooling:	13A-2	
Installation torque:	40-50	Nm
Weight:	0.10	kg



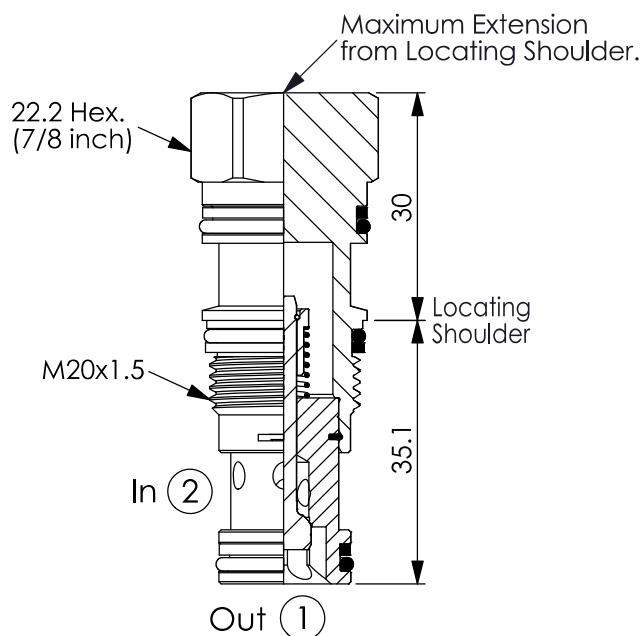
X	OPERATION	
21	2 to 1 (Free Flow)	

Y	SPRINGS	
	Cracking pressure	
03	0.3 bar	
10	1.0 bar	
20	2.0 bar	
35	3.5 bar	
50	5.0 bar	
70	7.0 bar	

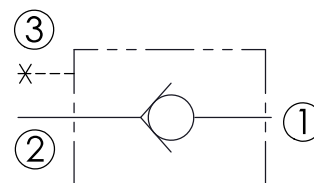
Z	OPTION	
N	Non-adjustable	

CHECK VALVES

Ordering Code: **CV-11A-X-Y-Z**

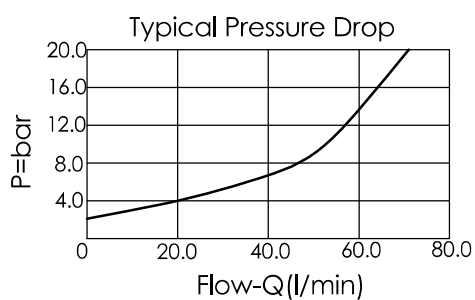


UNIT:mm



TECHNICAL DATA

Max. pressure:	350	bar
Rated flow:	60	l/min
Cavity-Tooling:	11A-3	
Installation torque:	40-50	Nm
Weight:	0.12	kg



X OPERATION

21 2 to 1 (Free Flow)

Y

SPRINGS

Cracking pressure

03	0.3 bar	
10	1.0 bar	
20	2.0 bar	
35	3.5 bar	
50	5.0 bar	
70	7.0 bar	

Z

OPTION

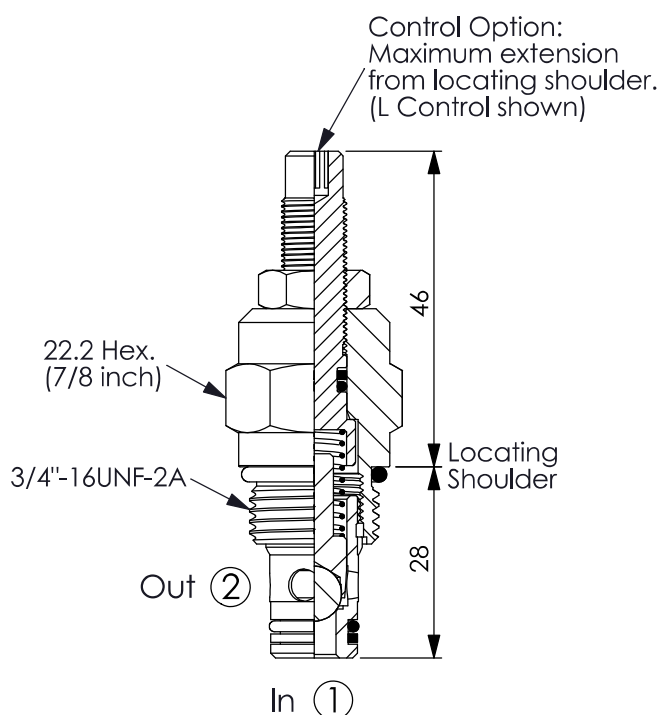
N

Non-adjustable

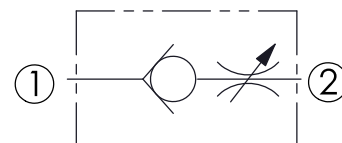
CHECK VALVE

(With Screw Adjustment)

Ordering Code: **CV-08W-X-Y-Z**

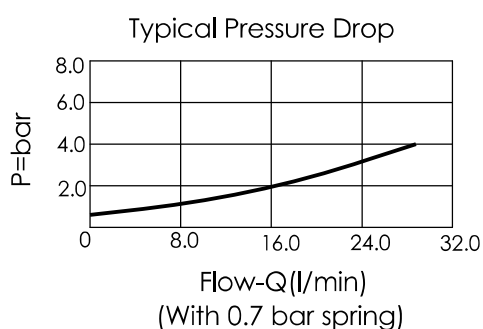


UNIT:mm



TECHNICAL DATA

Max. pressure:	240	bar
Rated flow:	30	l/min
Cavity-Tooling:	08W-2	
Installation torque:	25-35	Nm
Weight:	0.11	kg



X OPERATION

20 1 to 2 (Free Flow)

Y

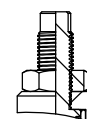
SPRINGS

Cracking pressure

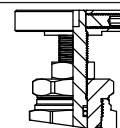
03	0.3 bar	
07	0.7 bar	
17	1.7 bar	
41	4.1 bar	
69	6.9 bar	
103	10.3 bar	
138	13.8 bar	
176	17.6 bar	

Z OPTIONS

L Leakproof hex. socket screw.



E Handknob and locknut.



CHECK VALVE
(With External Port)

Ordering Code: **CV-08W-X-Y-Z**

22.2 Hex.
(7/8 inch)

3/4"-16UNF-2A

External Port

19

28

Locating Shoulder

Out ②

In ①

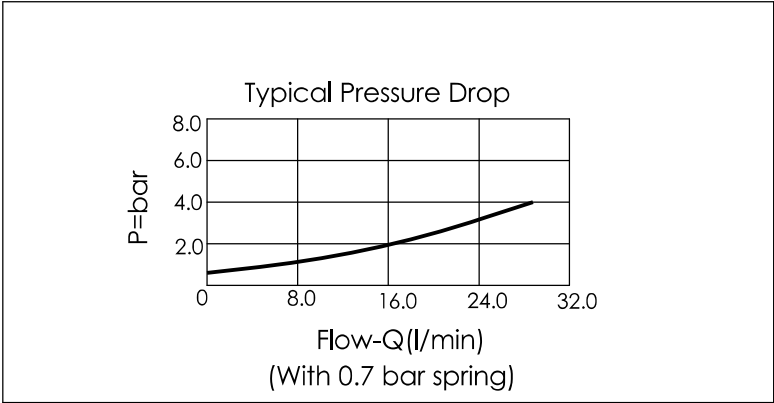
UNIT:mm

External Port

①

②

TECHNICAL DATA		
Max. pressure:	240	bar
Rated flow:	30	l/min
Cavity-Tooling:	08W-2	
Installation torque:	25-35	Nm
Weight:	0.06	kg



X	OPERATION	
28	1 to 2 Free Flow with External Port	

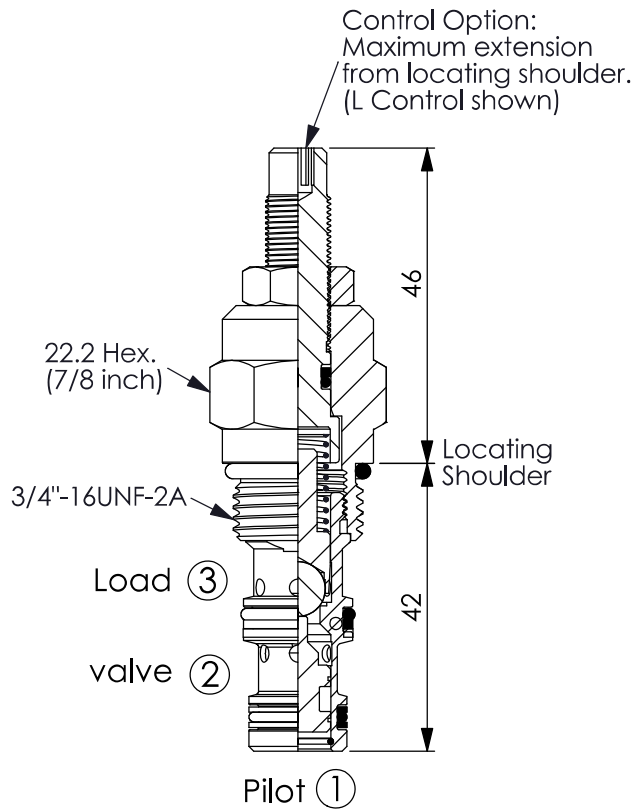
Y	SPRINGS	
	Cracking pressure	
03	0.3 bar	
07	0.7 bar	
17	1.7 bar	
41	4.1 bar	
69	6.9 bar	
103	10.3 bar	
138	13.8 bar	
176	17.6 bar	

Z	OPTIONS (External Ports)	
G03	G 3/8"	

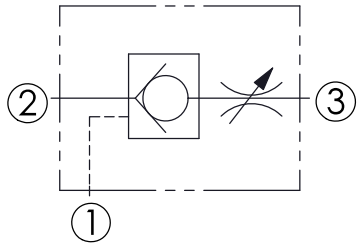
CHECK VALVE

(Pilot-To-Open with Adjustment)

Ordering Code: **CO-08W-X-Y-Z**

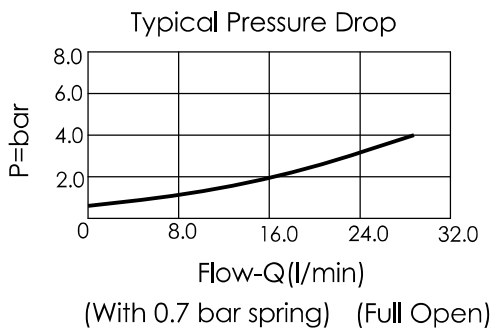


UNIT:mm



TECHNICAL DATA

Max. pressure:	240	bar
Rated flow:	30	l/min
Cavity-Tooling:	08W-3	
Installation torque:	25-35	Nm
Weight:	0.12	kg



X

OPERATION

30

2 to 3 Free Flow
(Pilot to Open)
(Check Spring Bias)
Min. 1.7 bar

Y

SPRINGS

Cracking pressure

17

1.7 bar

41

4.1 bar

69

6.9 bar

103

10.3 bar

138

13.8 bar

176

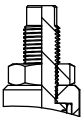
17.6 bar

Z

OPTION

L

Leakproof hex.
socket screw.



CHECK VALVE
(Pilot-To-Open)

Ordering Code: **CO-11A-X-Y-Z**

22.2 Hex.
(7/8 inch)

Pilot ③

M20x1.5

Valve ②

Load ①

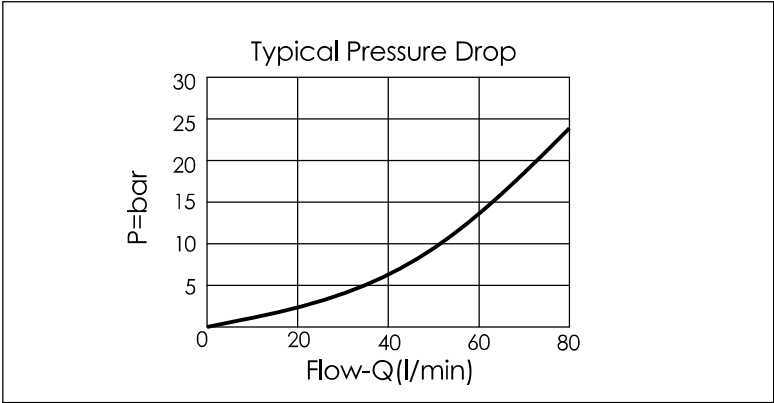
30

35.1

Locating
Shoulder

UNIT:mm

TECHNICAL DATA		
Max. pressure:	350	bar
Rated flow:	60	l/min
Cavity-Tooling:	11A-3	
Installation torque:	40-50	Nm
Weight:	0.13	kg



X	OPERATION	
30	2 to 1 (Free Flow)	
3D	2 to 1 (Free Flow) Sealed Pilot Piston	

Y	SPRINGS	
	Cracking pressure	
03	0.3 bar	
20	2.0 bar	
50	5.0 bar	

Z	OPTION	
N	Standard Pilot	

CHECK VALVE
(Pilot-To-Open)

Ordering Code: **CO-2A-X-Y-Z**

28.5 Hex.
(1 1/8 inch)

Pilot ③

1.00-14UNS-2A

Valve ②

Load ①

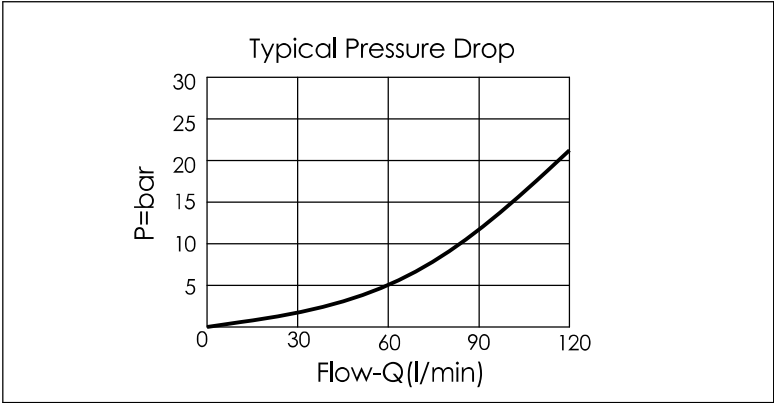
35

35.1

Locating Shoulder

UNIT:mm

TECHNICAL DATA		
Max. pressure:	350	bar
Rated flow:	120	l/min
Cavity-Tooling:	2A-3	
Installation torque:	60-70	Nm
Weight:	0.24	kg



X	OPERATION	
30	2 to 1 (Free Flow)	

Y	SPRINGS	
	Cracking pressure	
03	0.3 bar	
20	2.0 bar	
50	5.0 bar	

Z	OPTION	
N	Standard Pilot	

CHECK VALVE

(Pilot-To-Open)

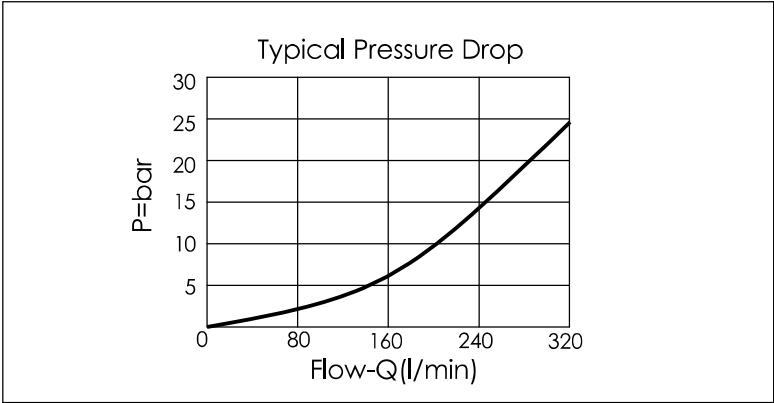
Ordering Code:

CO-17A-X-Y-Z

UNIT:mm

TECHNICAL DATA

Max. pressure:	350	bar
Rated flow:	240	l/min
Cavity-Tooling:	17A-3	
Installation torque:	200-215	Nm
Weight:	0.52	kg



X	OPERATION	
30	2 to 1 (Free Flow)	

Y	SPRINGS	
	Cracking pressure	
03	0.3 bar	
20	2.0 bar	
50	5.0 bar	

Z	OPTION	
N	Standard Pilot	

CHECK VALVE

(Pilot-To-Open)

Ordering Code: **CO-19A-X-Y-Z**

41.2 Hex.
(1 5/8 inch)

Pilot ③

M48x2

Valve ②

Load ①

59

63.5

Locating
Shoulder

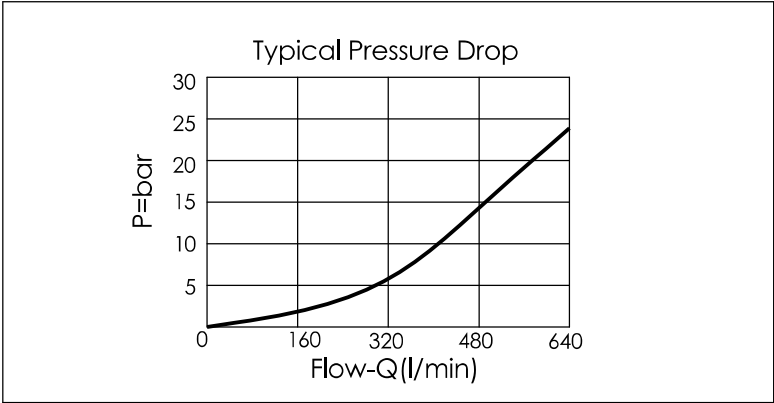
UNIT:mm

②

③

①

TECHNICAL DATA		
Max. pressure:	350	bar
Rated flow:	480	l/min
Cavity-Tooling:	19A-3	
Installation torque:	465-500	Nm
Weight:	1.19	kg



X	OPERATION	
30	2 to 1 (Free Flow)	

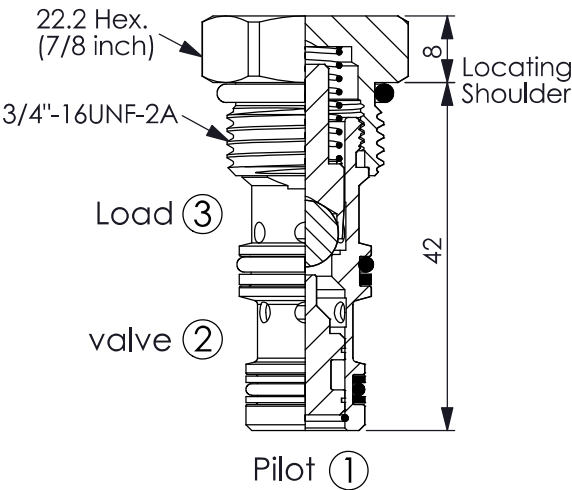
Y	SPRINGS	
	Cracking pressure	
03	0.3 bar	
20	2.0 bar	
50	5.0 bar	

Z	OPTION	
N	Standard Pilot	

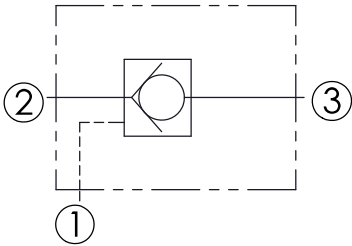
CHECK VALVE
(Pilot-To-Open)

Ordering Code: **CO-08W-X-Y-Z**

Example:CO-08W-30-17-N
Example:CO-08W-3A-69-N

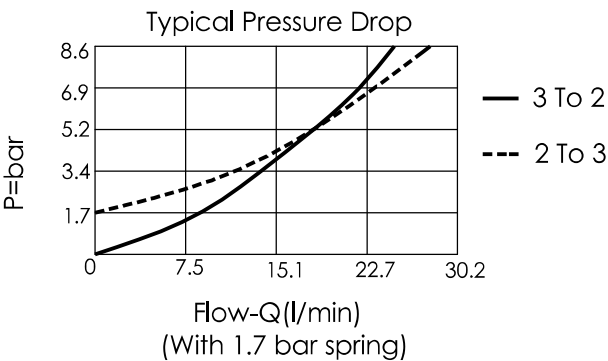


UNIT:mm



TECHNICAL DATA

Max. pressure:	240	bar
Rated flow:	30	l/min
Cavity-Tooling:	08W-3	
Installation torque:	25-35	Nm
Weight:	0.06	kg



X

OPERATION

30

2 to 3 (Free Flow)
(Check Spring Bias)
(Min. 1.7 bar)

3A

2 to 3 (Free Flow)
Sealed Pilot Piston
(Check Spring Bias)
(Min. 6.9 bar)

Y

SPRINGS

Cracking pressure

17

1.7 bar

41

4.1 bar

69

6.9 bar

103

10.3 bar

138

13.8 bar

176

17.6 bar

Z

OPTION

N

Standard Pilot Ratio
(3:1)

CHECK VALVE

(Vented Pilot-To-Open Check Valve With External Pilot Port)

Ordering Code: **CO-2A-X-Y-Z**

28.5 Hex.
(1 1/8 inch)

External Pilot Port

35

Drain ③

1.00-14UNS-2A

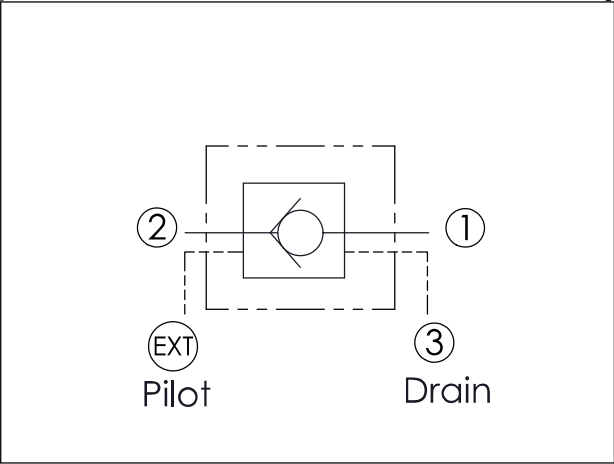
Valve ②

35.1

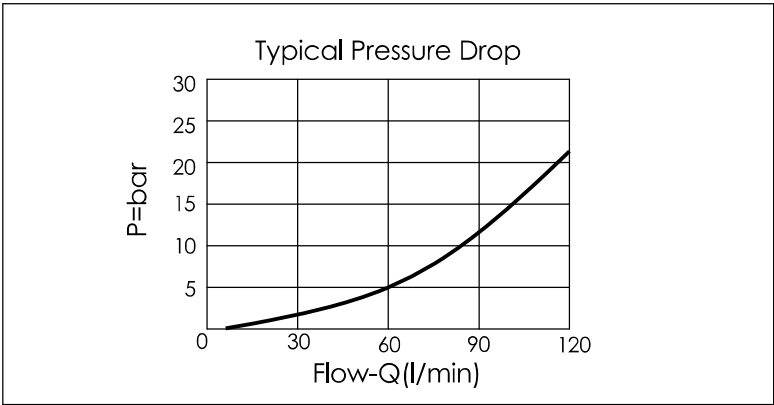
Load ①

Locating Shoulder

UNIT:mm



TECHNICAL DATA		
Max. pressure:	350	bar
Rated flow:	120	l/min
Cavity-Tooling:	2A-3	
Installation torque:	60-70	Nm
Weight:	0.25	kg



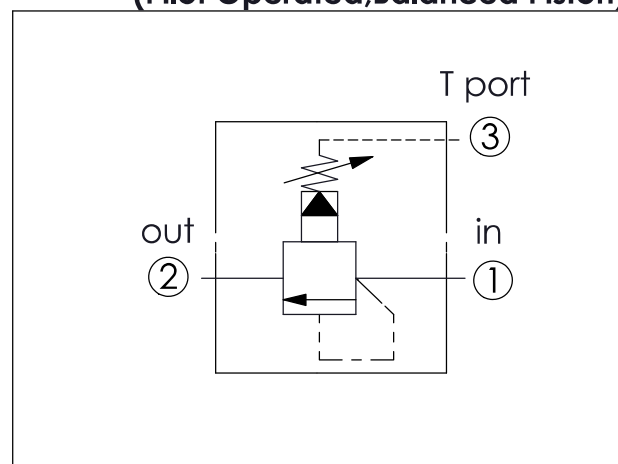
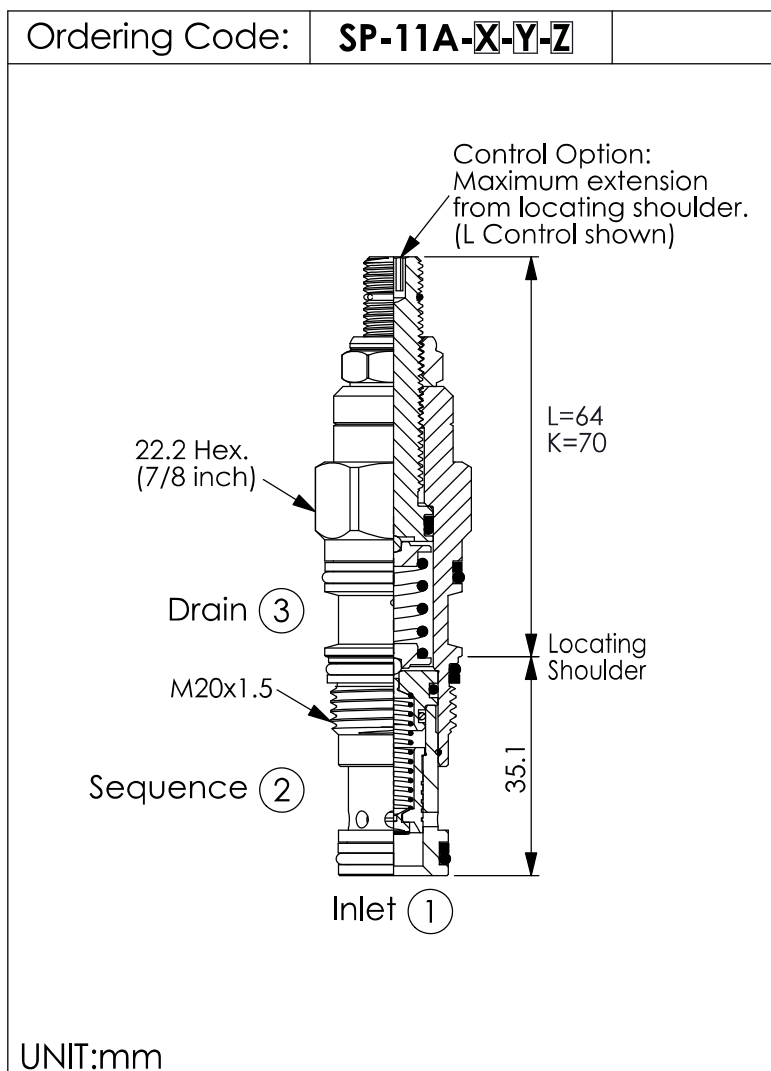
X	OPERATION	
30	Sealed Pilot Piston	

Y	SPRINGS	
	Cracking pressure	
20	2.0 bar	
35	3.5 bar	
50	5.0 bar	
70	7.0 bar	

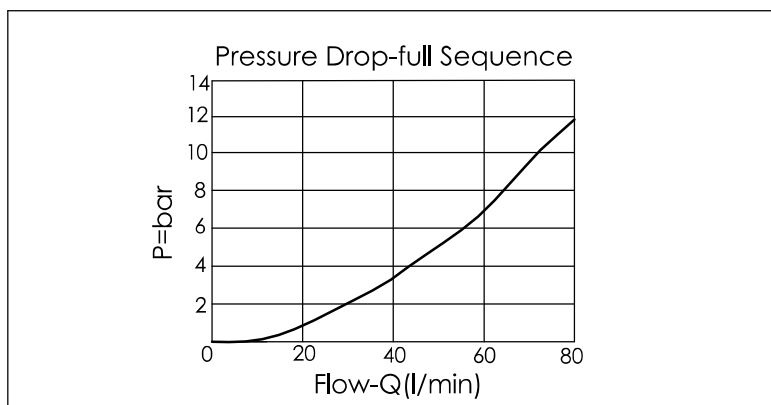
Z	OPTION	
G02	External Pilot Port G1/4"	

SEQUENCE VALVE

(Pilot Operated, Balanced Piston)



TECHNICAL DATA		
Max.Operating pressure:	350	bar
Rated flow:	60	l/min
Cavity-Tooling:	11A-3	
Installation torque:	40-50	Nm
Weight:	0.15	kg



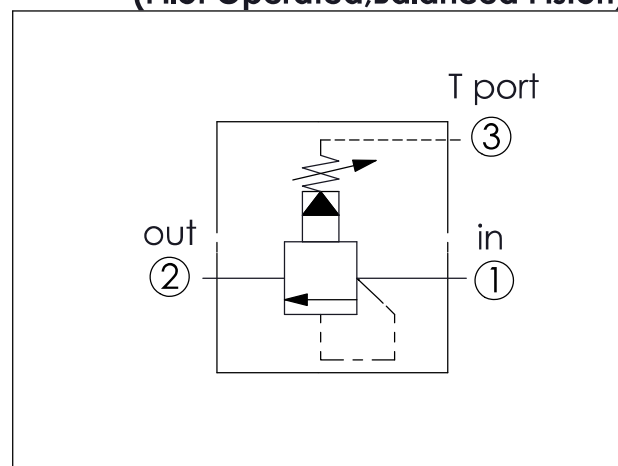
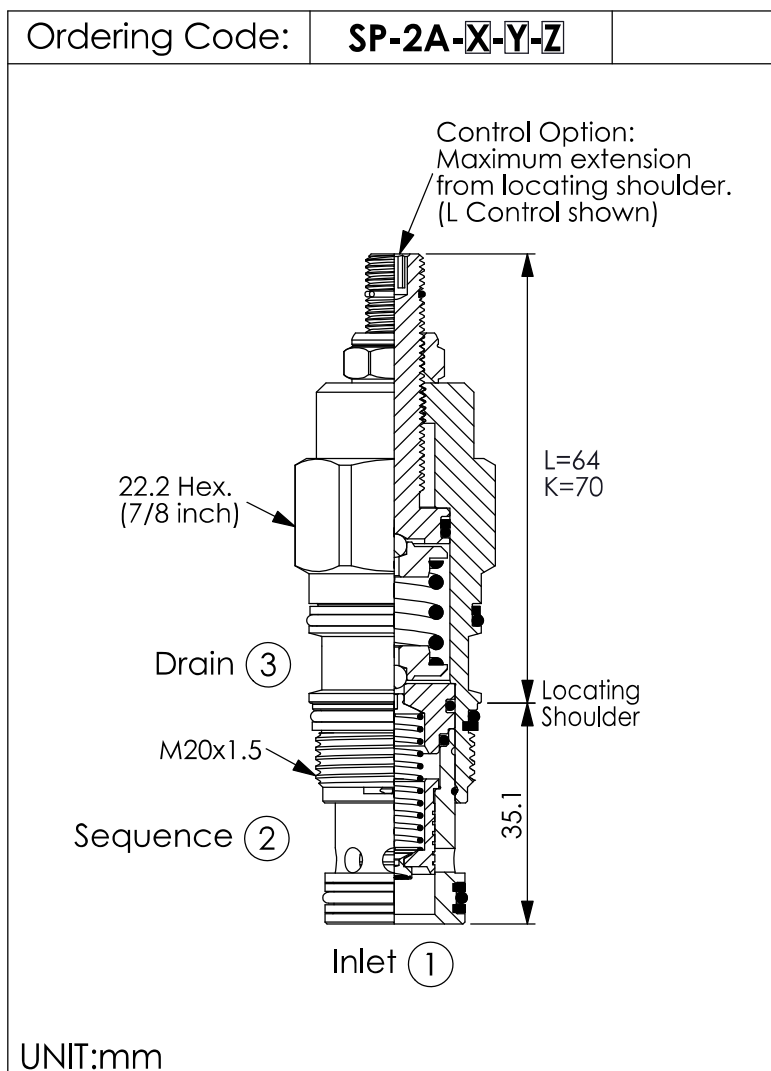
X	OPERATION	
30	Standard Type	

Y	SPRINGS	
	ADJUSTMENT RANGES	
A	7 to 210 bar (70 bar Standard Setting)	

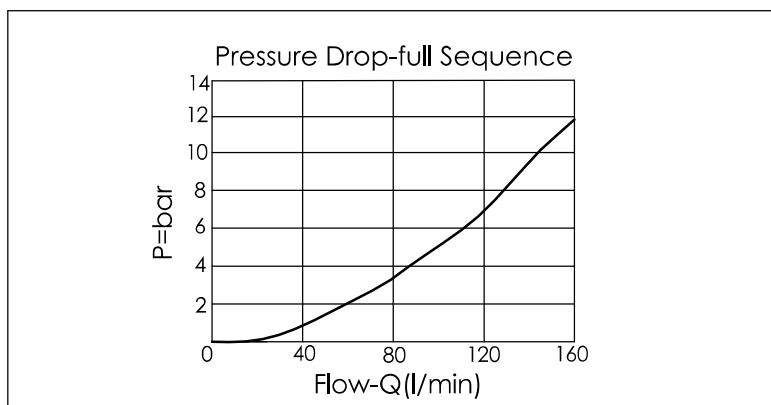
Z	OPTIONS	
L	Leakproof hex. socket screw.	
K	Handknob with Lock Konb.	
C	Tamper Resistant Cover.	

SEQUENCE VALVE

(Pilot Operated, Balanced Piston)



TECHNICAL DATA		
Max.Operating pressure:	350	bar
Rated flow:	120	l/min
Cavity-Tooling:	2A-3	
Installation torque:	60-70	Nm
Weight:	0.28	kg



X	OPERATION	
30	Standard Type	

Y	SPRINGS	
	ADJUSTMENT RANGES	
A	7 to 210 bar	(70 bar Standard Setting)

Z	OPTIONS	
L	Leakproof hex. socket screw.	
K	Handknob with Lock Konb.	
C	Tamper Resistant Cover.	

SEQUENCE VALVE

Ordering Code: **SQ-08W-X-Y-Z**

Control Option:
Maximum extension
from locating shoulder.
(L Control shown)

25.4 Hex.
(1.0 inch)

3/4"-16UNF-2A

Locating
Shoulder

79.2

42

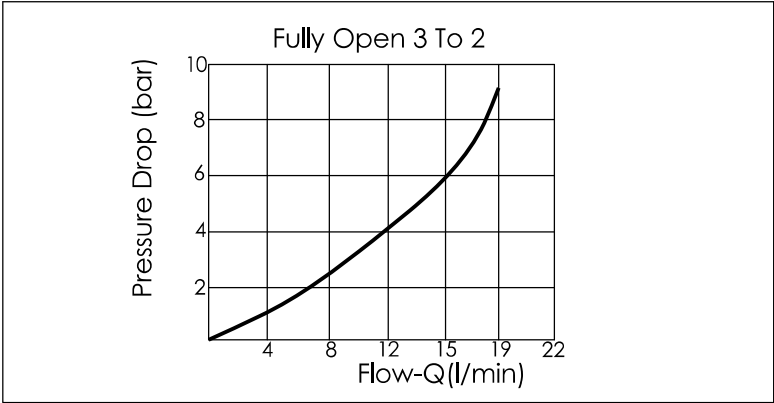
③

②

①

UNIT:mm

TECHNICAL DATA		
Max. pressure:	240	bar
Rated flow:	See Performance Chart	
Cavity-Tooling:	08W-3	
Installation torque:	25-35	Nm
Weight:	0.23	kg



X	PILOT RATIO	
33	External Pilot, Internal Drain	

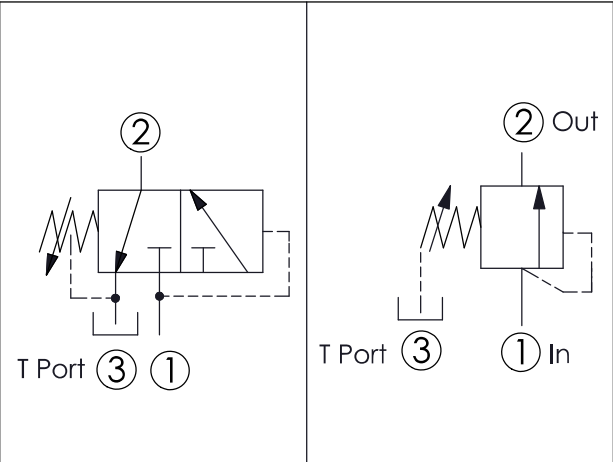
Y	SPRINGS	
	ADJUSTMENT RANGES	
B	10.0 to 90.0 bar	
D	7.0 to 42.0 bar	
E	3.0 to 21.0 bar	
K	20.0 to 166.0 bar	

Z	OPTIONS	
L	Leakproof hex. socket screw.	
E	Handknob and locknut.	

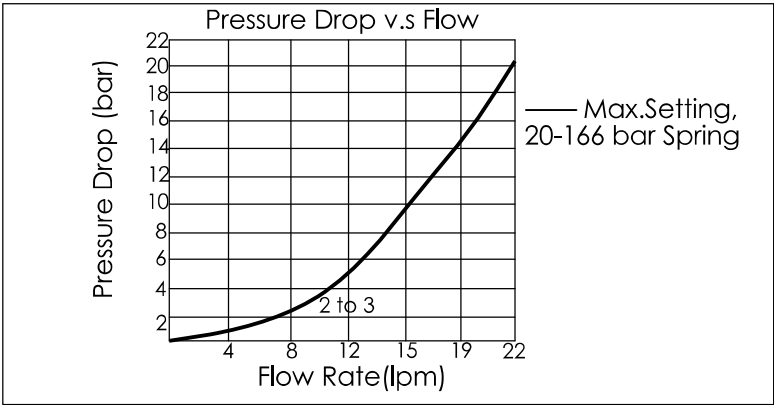
SEQUENCE VALVE

Ordering Code: **SQ-08W-X-Y-Z**

UNIT:mm



TECHNICAL DATA		
Max. pressure:	240	bar
Rated flow:	22	l/min
Cavity-Tooling:	08W-3	
Installation torque:	25-35	Nm
Weight:	0.23	kg



X	PILOT RATIO	
30	Internal Pilot & Drain	

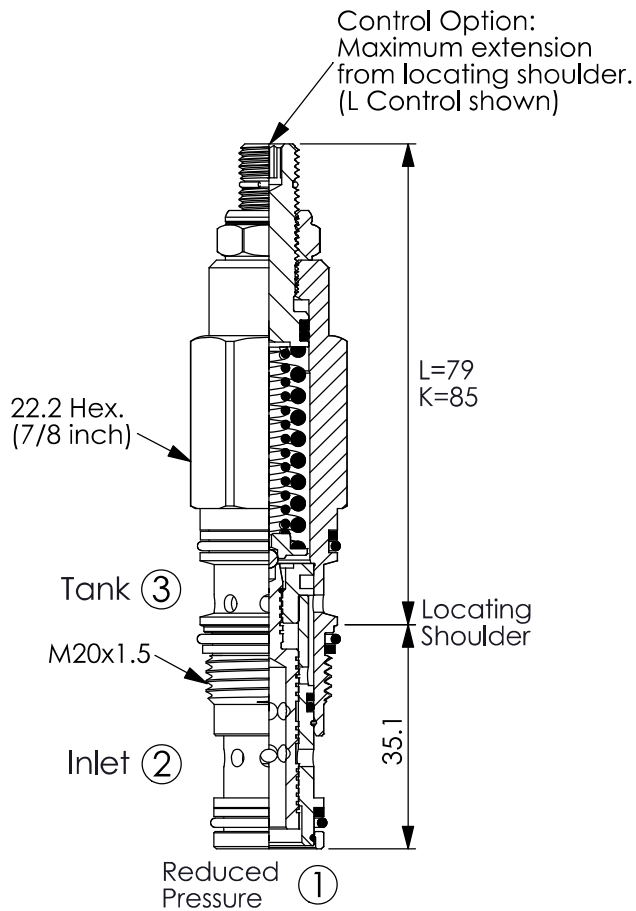
Y	SPRINGS	
	ADJUSTMENT RANGES	
B	10.0 to 90.0 bar	
D	7.0 to 42.0 bar	
E	3.0 to 21.0 bar	
K	20.0 to 166.0 bar	

Z	OPTIONS	
L	Leakproof hex. socket screw.	
E	Handknob and locknut.	

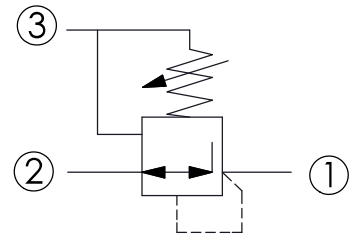
REDUCING/RELIEVING VALVE

(Direct Acting)

Ordering Code: **PD-11A-X-Y-Z**

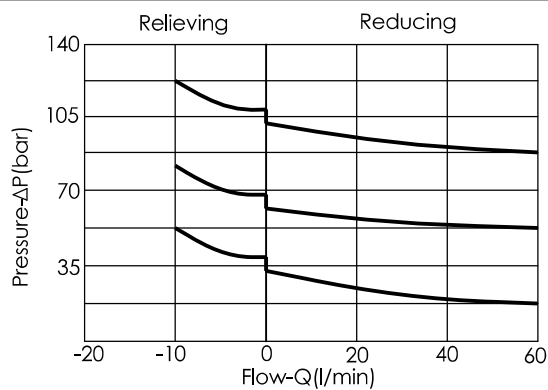


UNIT:mm



TECHNICAL DATA

Max.Operating pressure:	350	bar
Rated flow:	40	l/min
Cavity-Tooling:	11A-3	
Installation torque:	40-50	Nm
Weight:	0.19	kg



X OPERATION

30 Standard Type

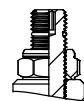
Y SPRINGS

ADJUSTMENT RANGES

A	35 to 210 bar (70 bar Standard Setting)
B	3.5 to 105 bar (35 bar Standard Setting)
D	1.7 to 55 bar (30 bar Standard Setting)
E	1.7 to 28 bar (14 bar Standard Setting)

Z OPTIONS

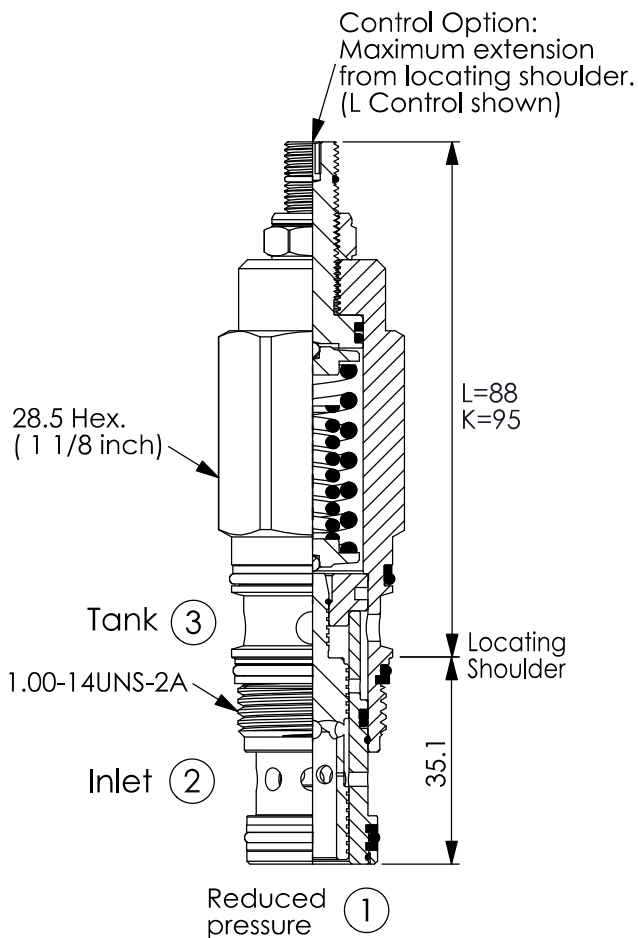
L Leakproof hex. socket screw.



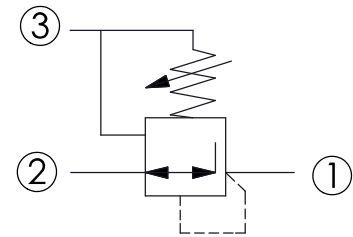
REDUCING/RELIEVING VALVE

(Direct Acting)

Ordering Code: **PD-2A-X-Y-Z**

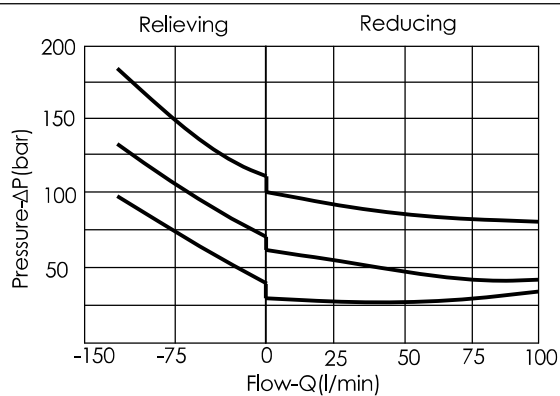


UNIT:mm



TECHNICAL DATA

Max.Operating pressure:	350	bar
Rated flow:	80	l/min
Cavity-Tooling:	2A-3	
Installation torque:	60-70	Nm
Weight:	0.35	kg



X OPERATION

30 Standard Type

Y

SPRINGS

ADJUSTMENT RANGES

A	50 to 210 bar (70 bar Standard Setting)
B	20 to 105 bar (35 bar Standard Setting)
D	14 to 55 bar (30 bar Standard Setting)
E	7 to 28 bar (14 bar Standard Setting)

Z

OPTIONS

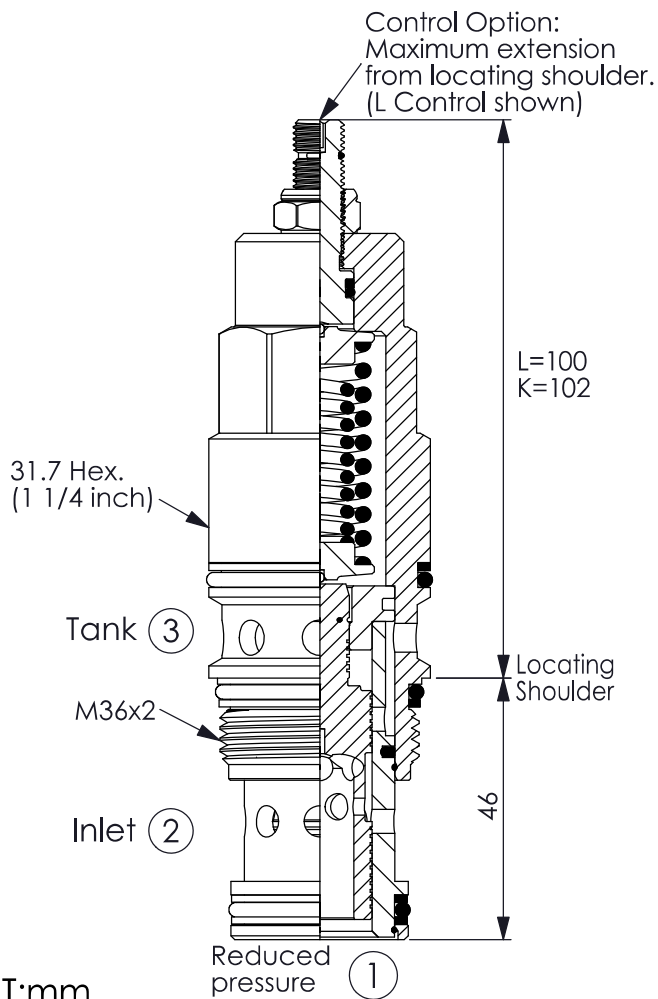
L Leakproof hex. socket screw.



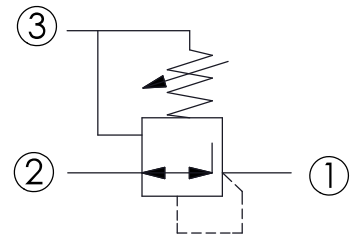
REDUCING/RELIEVING VALVE

(Direct Acting)

Ordering Code: **PD-17A-X-Y-Z**

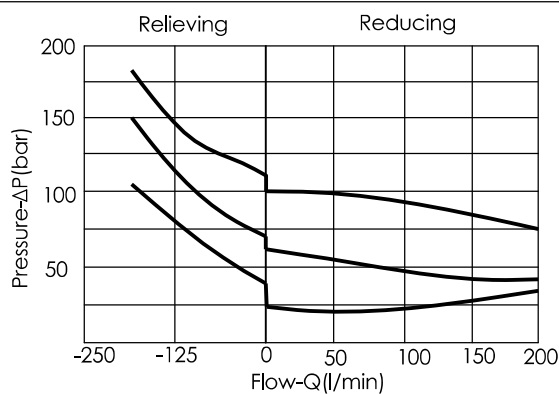


UNIT:mm



TECHNICAL DATA

Max.Operating pressure:	350	bar
Rated flow:	160	l/min
Cavity-Tooling:	17A-3	
Installation torque:	200-215	Nm
Weight:	0.70	kg



X OPERATION

30 Standard Type

Y

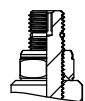
SPRINGS

ADJUSTMENT RANGES

A	50 to 210 bar (70 bar Standard Setting)
B	20 to 105 bar (35 bar Standard Setting)
D	14 to 55 bar (30 bar Standard Setting)
E	7 to 28 bar (14 bar Standard Setting)

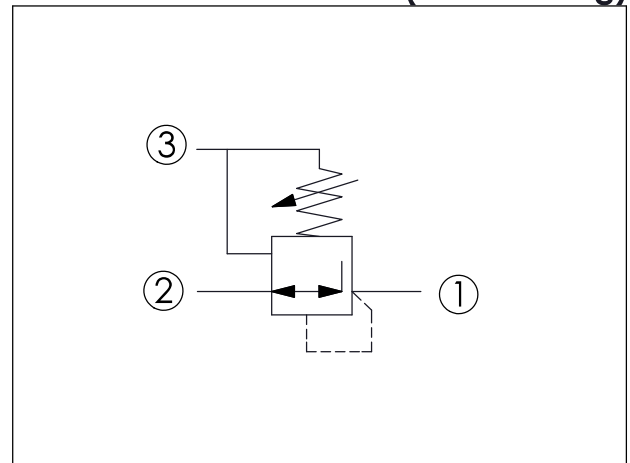
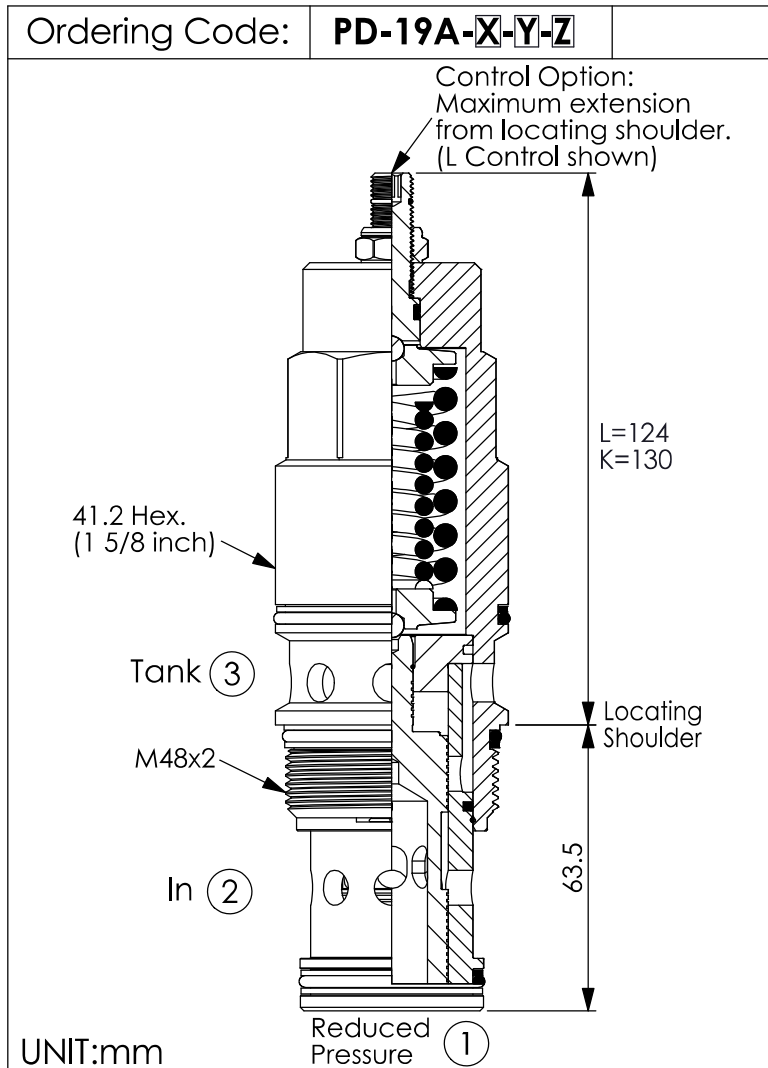
Z OPTIONS

L Leakproof hex. socket screw.



REDUCING/RELIEVING VALVE

(Direct Acting)



TECHNICAL DATA

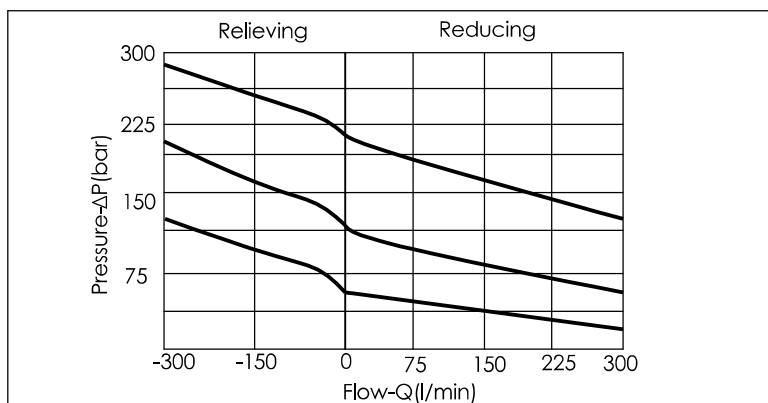
Max.Operating pressure: 350 bar

Rated flow: 320 l/min

Cavity-Tooling: 19A-3

Installation torque: 465-500 Nm

Weight: 1.50 kg



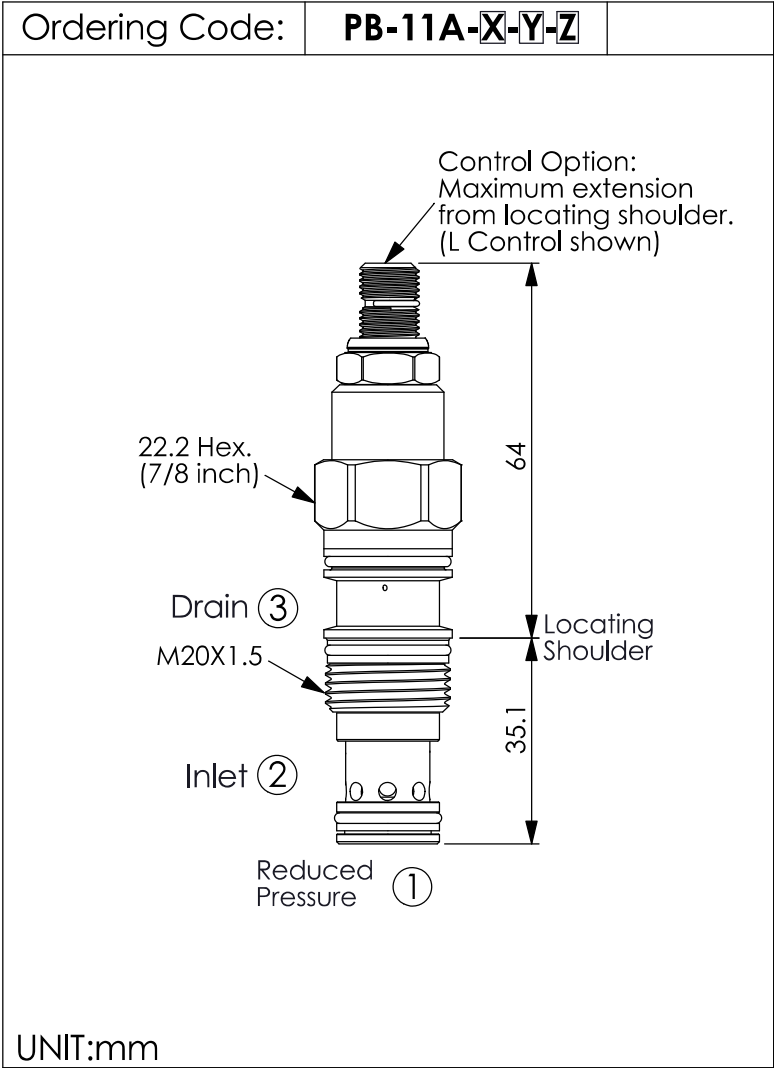
X	OPERATION	
	30	Standard Type

Y	SPRINGS	
	ADJUSTMENT RANGES	
A	50 to 210 bar (70 bar Standard Setting)	
B	20 to 105 bar (35 bar Standard Setting)	
D	14 to 55 bar (30 bar Standard Setting)	
E	7 to 28 bar (14 bar Standard Setting)	

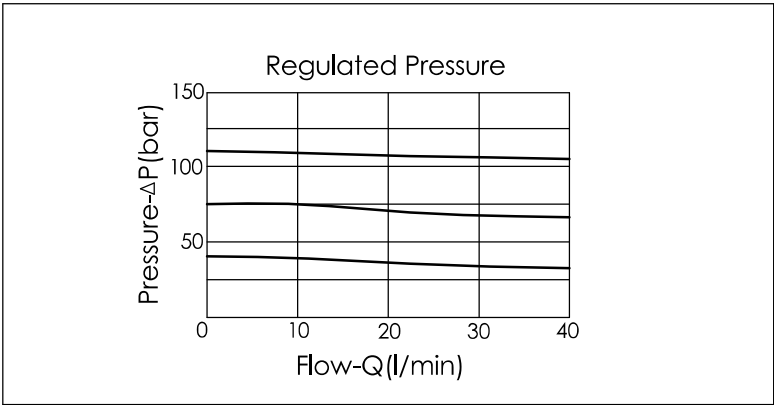
Z		OPTIONS	
L	Leakproof hex. socket screw.		

REDUCING VALVE

(Pilot Operated Reducing)



TECHNICAL DATA		
Max.Operating pressure: 350 bar		
Rated flow:	40	l/min
Cavity-Tooling:	11A-3	
Installation torque:	40-50	Nm
Weight:	0.16	kg



X	OPERATION	
30	Standard Type	

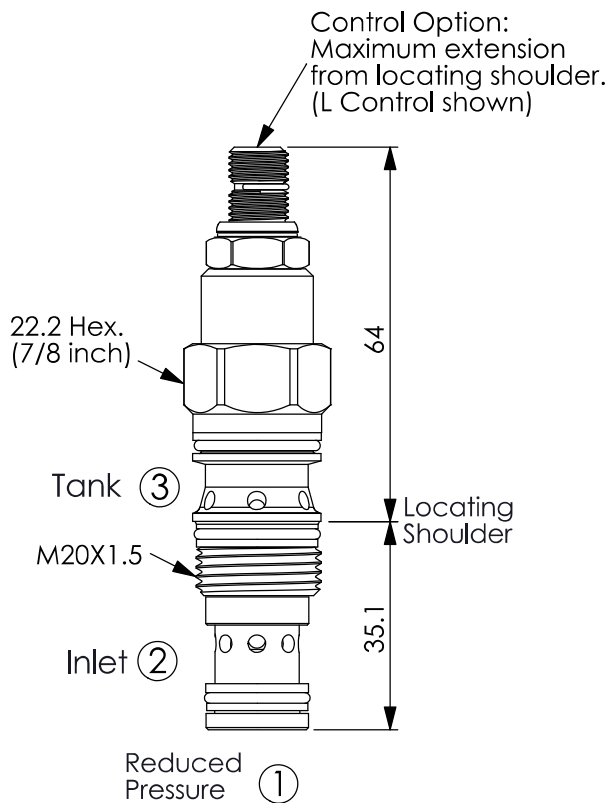
Y	SPRINGS	
	ADJUSTMENT RANGES	
A	7 to 210 bar (14 bar Standard Setting)	
B	3.5 to 105 bar (14 bar Standard Setting)	

Z	OPTIONS	
L	Leakproof hex. socket screw.	
K	Handknob with Lock Knob.	

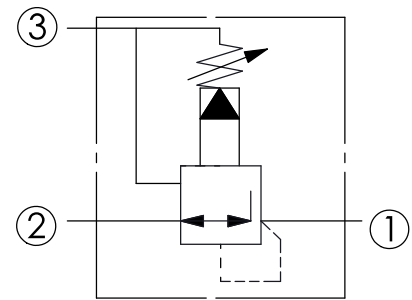
REDUCING/RELIEVING VALVE

(Pilot Operated)

Ordering Code: **PP-11A-X-Y-Z**

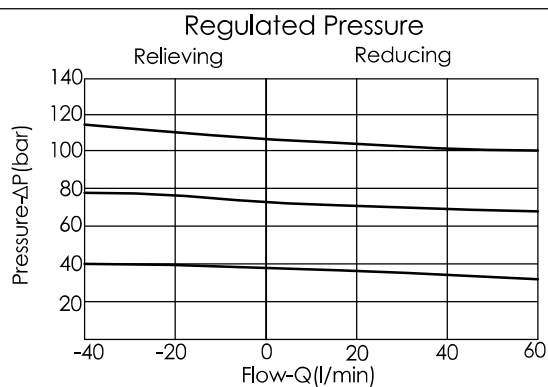


UNIT:mm



TECHNICAL DATA

Max.Operating pressure:	350	bar
Rated flow:	40	l/min
Cavity-Tooling:	11A-3	
Installation torque:	40-50	Nm
Weight:	0.15	kg



X OPERATION

30 Standard Type

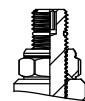
Y SPRINGS

ADJUSTMENT RANGES

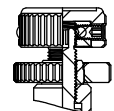
A	7 to 210 bar (14 bar Standard Setting)
B	3.5 to 105 bar (14 bar Standard Setting)

Z OPTIONS

L Leakproof hex. socket screw.

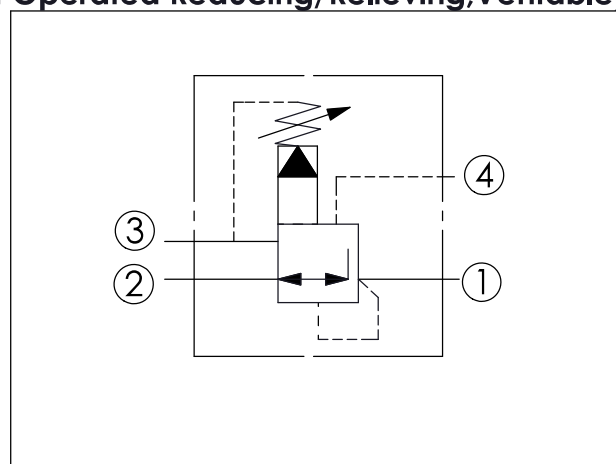
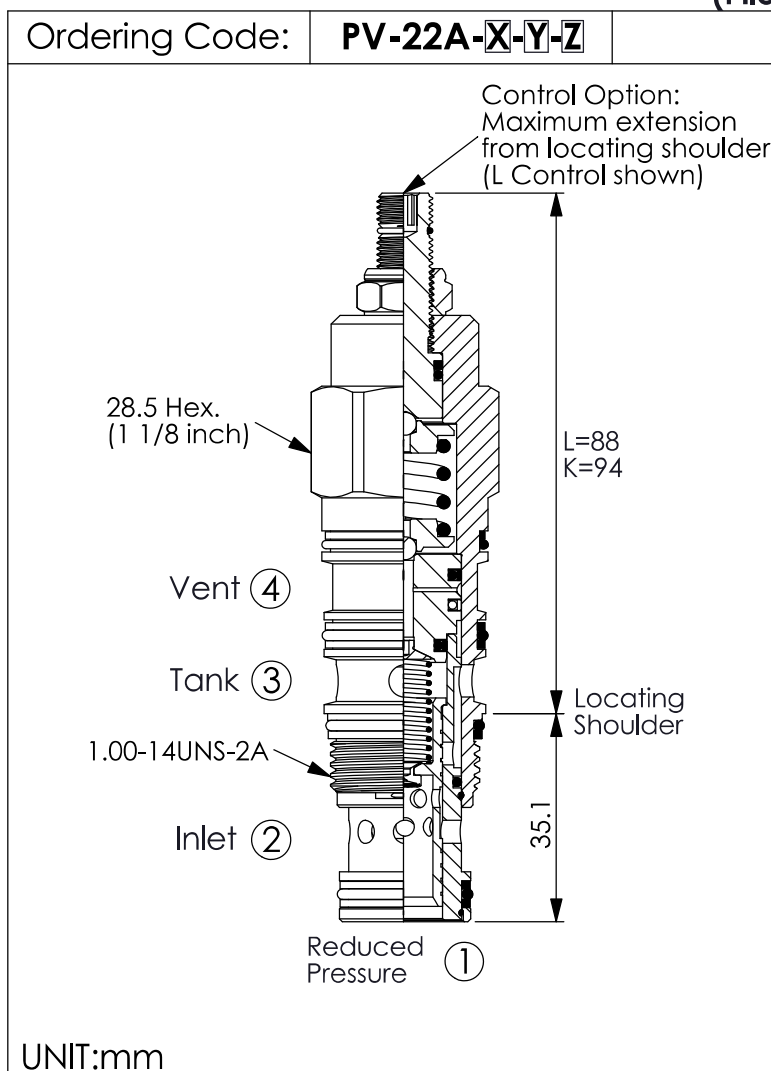


K Handknob with Lock Knob.

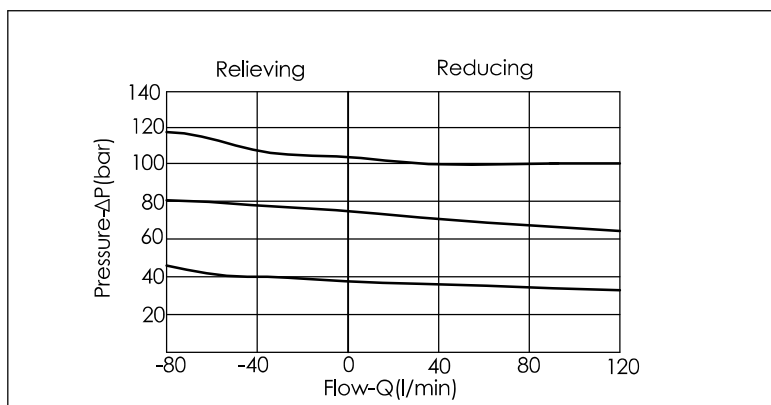


REDUCING/RELIEVING VALVE

(Pilot Operated Reducing/Relieving, Ventable)



TECHNICAL DATA		
Max.Operating pressure:	350	bar
Rated flow:	80	l/min
Cavity-Tooling:	22A-4	
Installation torque:	60-70	Nm
Weight:	0.33	kg



X	OPERATION	
40	Standard Type	

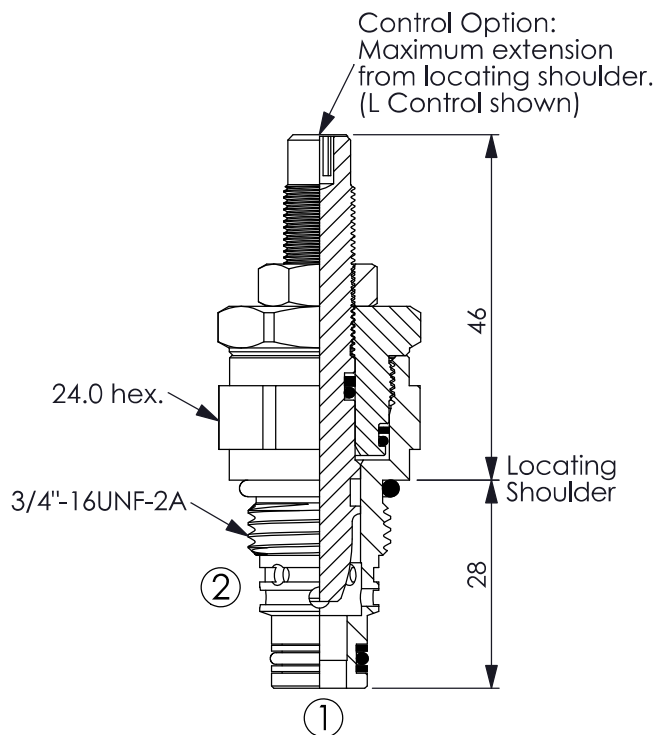
Y	SPRINGS	
	ADJUSTMENT RANGES	
A	7 to 210 bar (70 bar Standard Setting)	
D	1.7 to 55 bar (14 bar Standard Setting)	

Z	OPTIONS	
L	Leakproof hex. socket screw.	
K	Handknob with Lock Konb.	
C	Tamper Resistant Cover.	

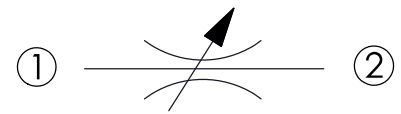
FLOW CONTROL VALVE

(Cartridge Restrictors)

Ordering Code: **NV-08W-X-Y-Z**



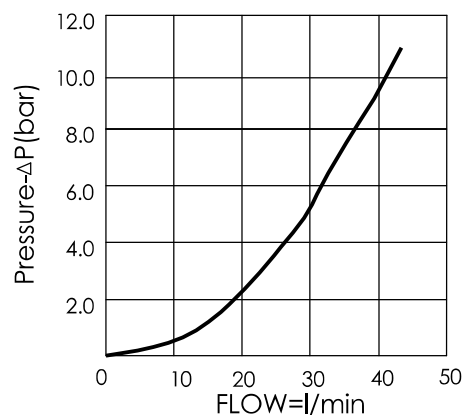
UNIT:mm



TECHNICAL DATA

Max. pressure:	350	bar
Rated Flow:	36 l/min ($\Delta P=7$ bar) See Performance Chart	
Cavity-Tooling:	08W-2	
Installation torque:	25-35	Nm
Weight:	0.13	kg

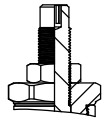
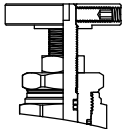
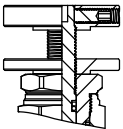
FULLY OPEN RESTRICTOR-FLOW IN BOTH DIRECTIONS



X OPERATION

20 Needle Valve

Z OPTIONS

L	Leakproof hex. socket screw.		
E	Handknob and locknut.		
B	Handknob and aluminum locknut.		

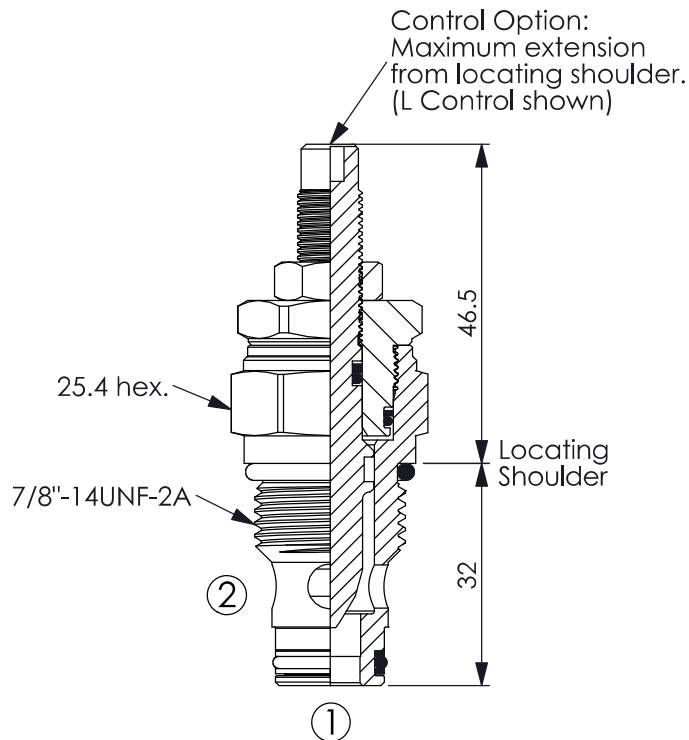
Y SPRING RANGE

N (Standard)

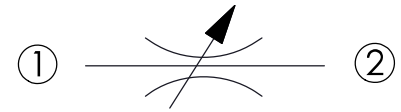
FLOW CONTROL VALVE

(Cartridge Restrictors)

Ordering Code: **NV-10W-X-Y-Z**

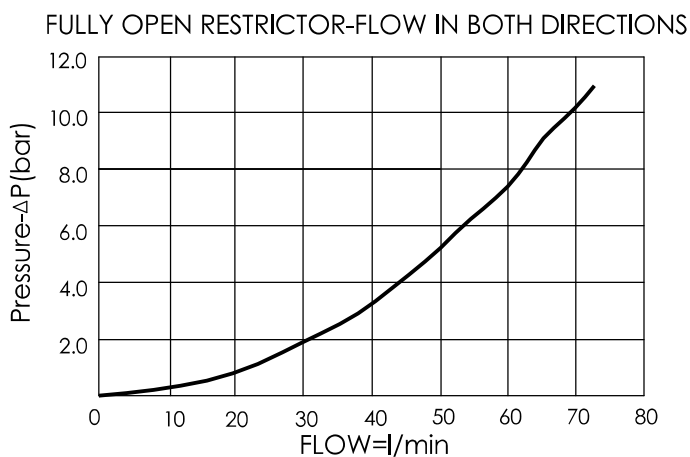


UNIT:mm



TECHNICAL DATA

Max. pressure:	350	bar
Rated Flow:	55 l/min ($\Delta P=7$ bar) See Performance Chart	
Cavity-Tooling:	10W-2	
Installation torque:	35-45	Nm
Weight:	0.16	kg

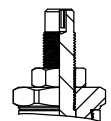


X OPERATION

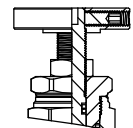
20 Needle Valve

Z OPTIONS

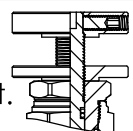
L Leakproof hex. socket screw.



E Handknob and locknut.



B Handknob and aluminum locknut.



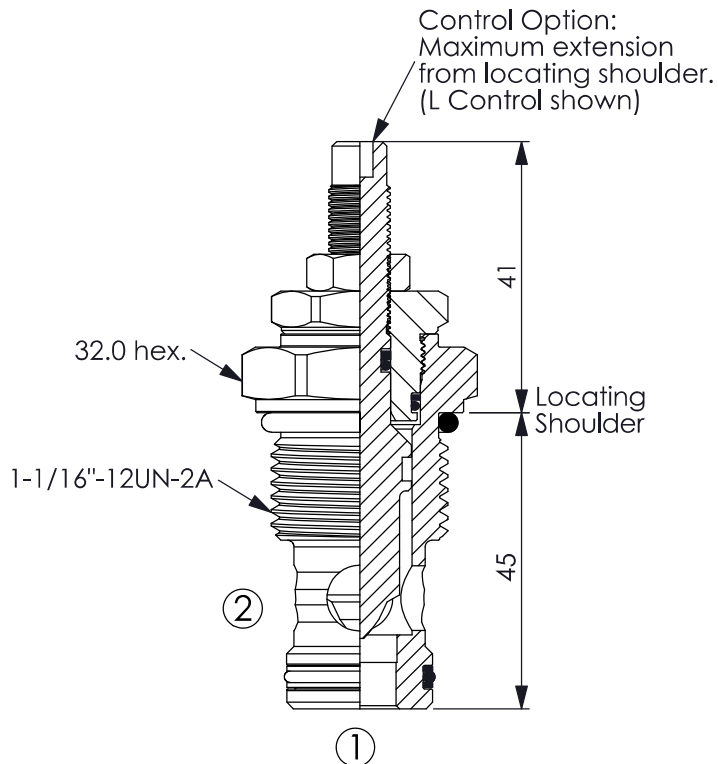
Y SPRING RANGE

N (Standard)

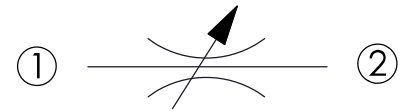
FLOW CONTROL VALVE

(Cartridge Restrictors)

Ordering Code: **NV-12W-X-Y-Z**

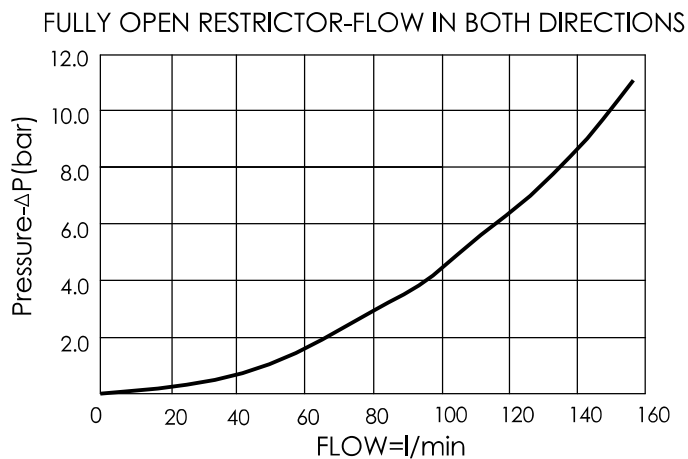


UNIT:mm



TECHNICAL DATA

Max. pressure:	350	bar
Rated Flow:	125 l/min ($\Delta P=7$ bar) See Performance Chart	
Cavity-Tooling:	12W-2	
Installation torque:	45-55	Nm
Weight:	0.21	kg



X OPERATION

20 Needle Valve

Z OPTIONS

L	Leakproof hex. socket screw.		
E	Handknob and locknut.		
B	Handknob and aluminum locknut.		

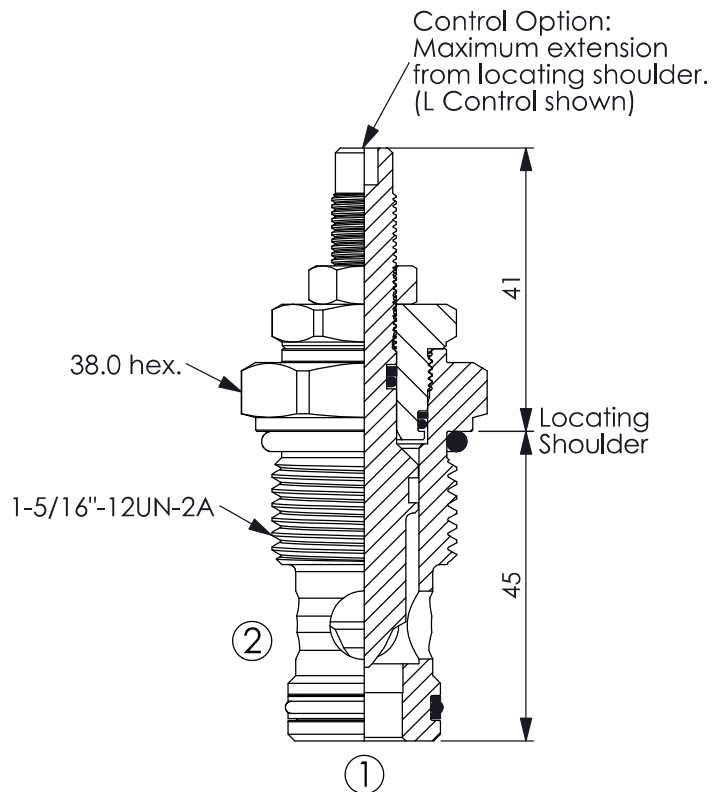
Y SPRING RANGE

N (Standard)

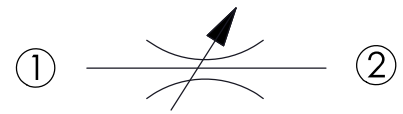
FLOW CONTROL VALVE

(Cartridge Restrictors)

Ordering Code: **NV-16W-X-Y-Z**



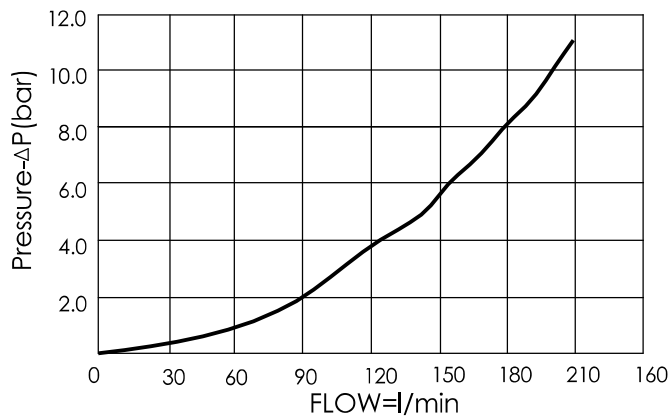
UNIT:mm



TECHNICAL DATA

Max. pressure:	350	bar
Rated Flow:	165 l/min ($\Delta P=7$ bar) See Performance Chart	
Cavity-Tooling:	16W-2	
Installation torque:	60-70	Nm
Weight:	0.3	kg

FULLY OPEN RESTRICTOR-FLOW IN BOTH DIRECTIONS

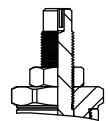


X OPERATION

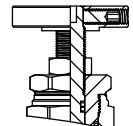
20 Needle Valve

Z OPTIONS

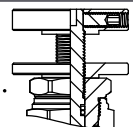
L Leakproof hex. socket screw.



E Handknob and locknut.



B Handknob and aluminum locknut.



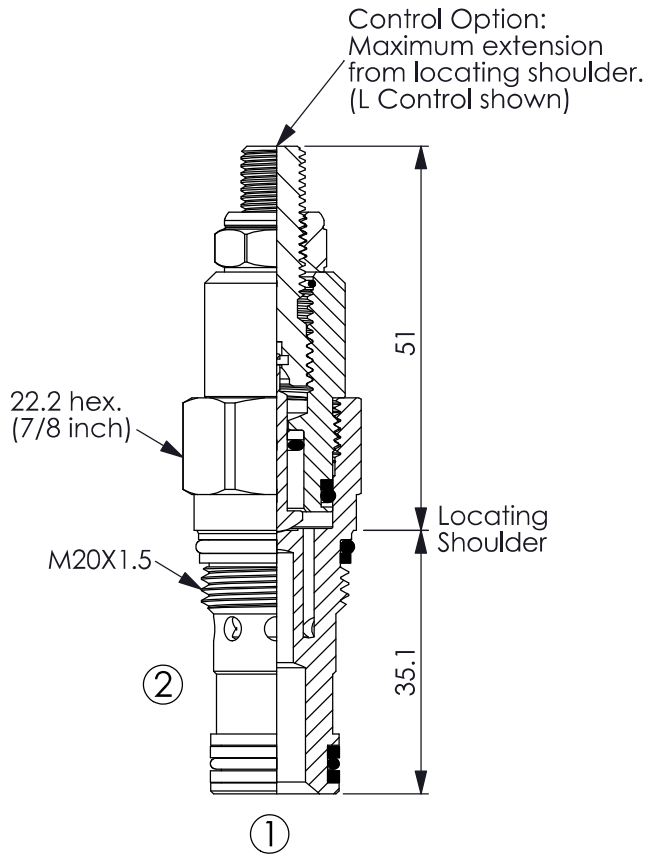
Y SPRING RANGE

N (Standard)

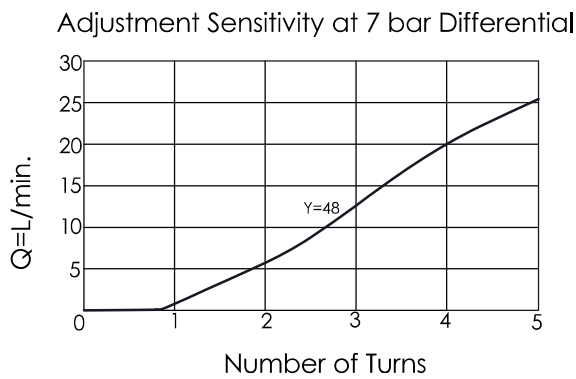
FLOW CONTROL VALVE

(Cartridge Restrictors)

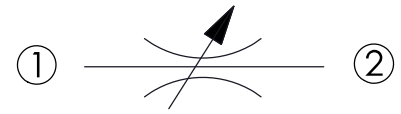
Ordering Code: **NV-13A-X-Y-Z**



UNIT:mm



Y	MAXIMUM NOMINAL ORIFICE DIAMETER	
48	4.8 mm	



TECHNICAL DATA

Max. operating pressure: 350 bar

Rated flow: 25 l/min ($\Delta P=7$ bar)
See Performance Chart

Cavity-Tooling: 13A-2

Installation torque: 45-50 Nm

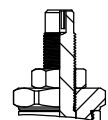
Weight: 0.14 kg

X OPERATION

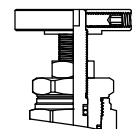
20 Needle Valve

Z OPTIONS

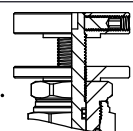
L Leakproof hex. socket screw.



E Handknob and locknut.



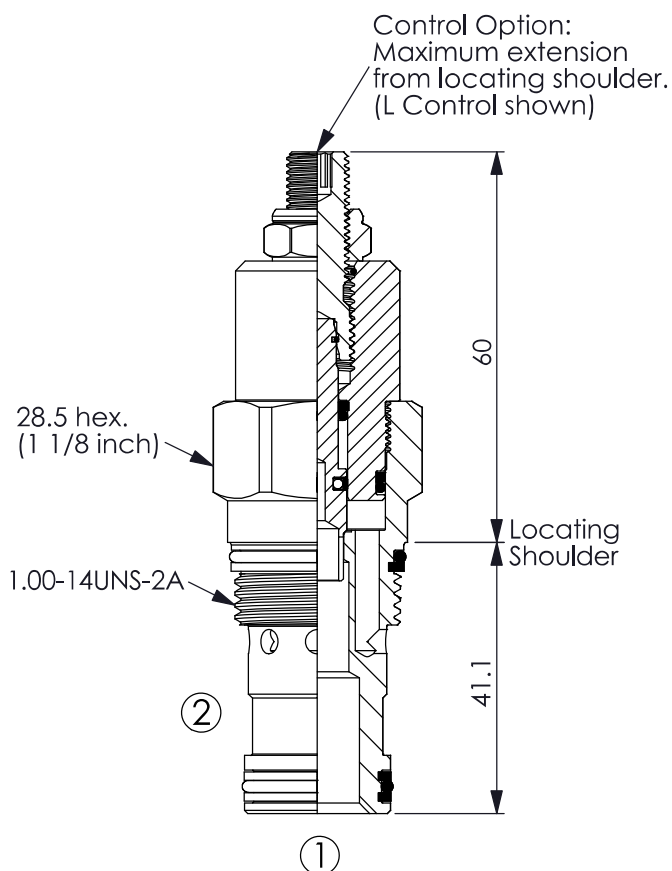
B Handknob and aluminum locknut.



FLOW CONTROL VALVE

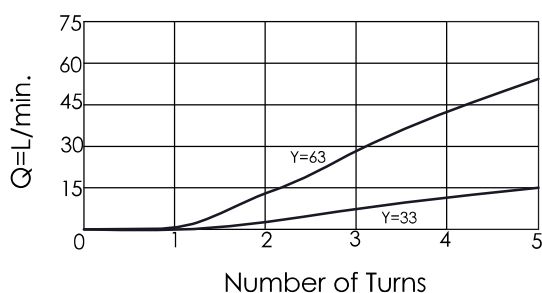
(Cartridge Restrictors)

Ordering Code: **NV-5A-X-Y-Z**

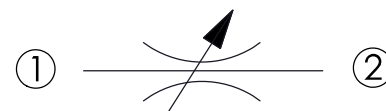


UNIT:mm

Adjustment Sensitivity at 7 bar Differential



Y	MAXIMUM NOMINAL ORIFICE DIAMETER	
33	3.3 mm	
63	6.3 mm	



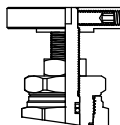
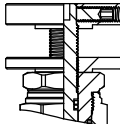
TECHNICAL DATA

Max. pressure:	350	bar
Rated Flow:	50 l/min ($\Delta P=7$ bar) See Performance Chart	
Cavity-Tooling:	5A-2	
Installation torque:	60-70	Nm
Weight:	0.26	kg

X OPERATION

20 Needle Valve

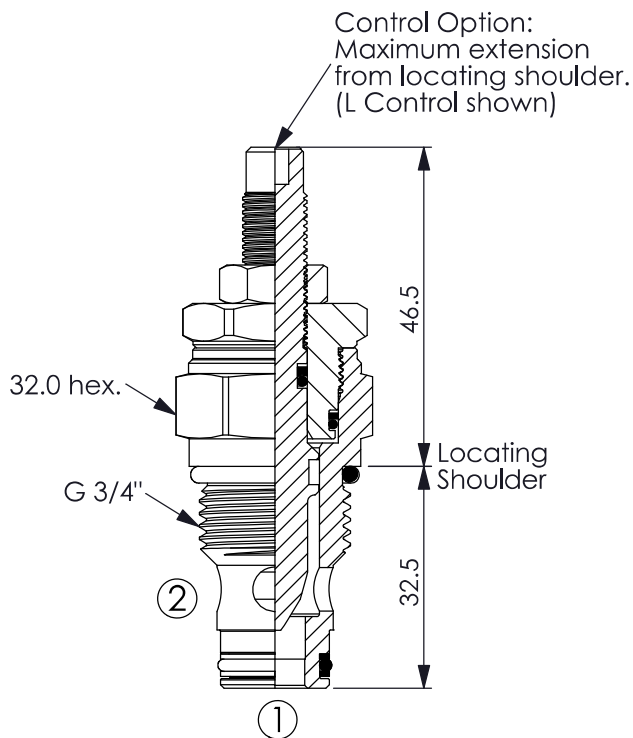
Z OPTIONS

L	Leakproof hex. socket screw.		
E	Handknob and locknut.		
B	Handknob and aluminum locknut.		

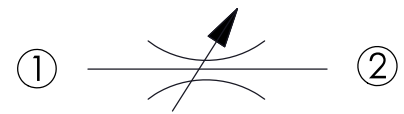
FLOW CONTROL VALVE

(Cartridge Restrictors)

Ordering Code: **NV-17E-X-Y-Z**



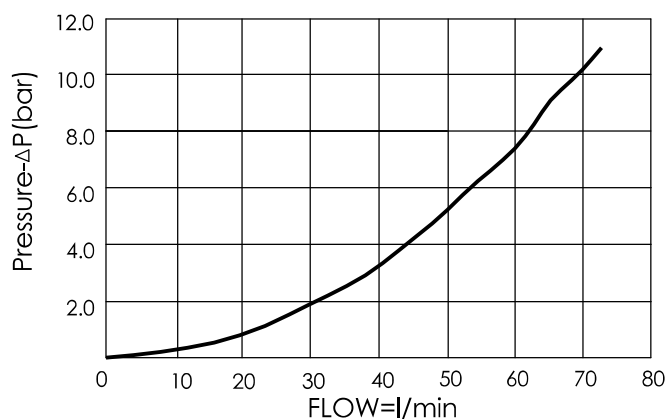
UNIT:mm



TECHNICAL DATA

Max. pressure:	350	bar
Rated Flow:	58 l/min ($\Delta P=7$ bar) See Performance Chart	
Cavity-Tooling:	17E-2	
Installation torque:	45-55	Nm
Weight:	0.2	kg

FULLY OPEN RESTRICTOR-FLOW IN BOTH DIRECTIONS

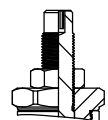


X OPERATION

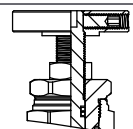
20 Needle Valve

Z OPTIONS

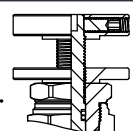
L Leakproof hex.
socket screw.



E Handknob and
locknut.



B Handknob and
aluminum locknut.



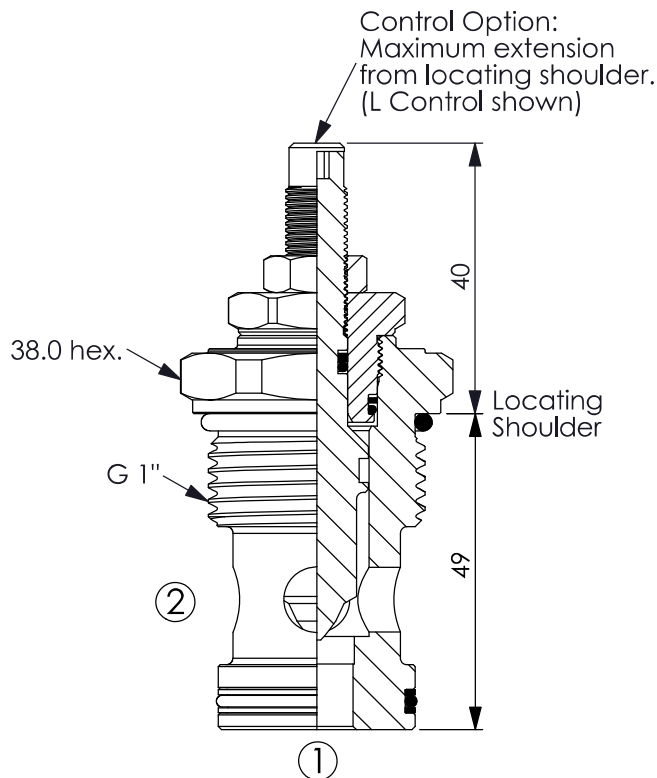
Y SPRING RANGE

N (Standard)

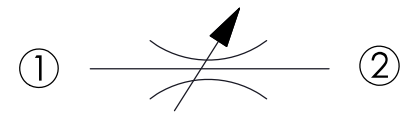
FLOW CONTROL VALVE

(Cartridge Restrictors)

Ordering Code: **NV-21E-X-Y-Z**



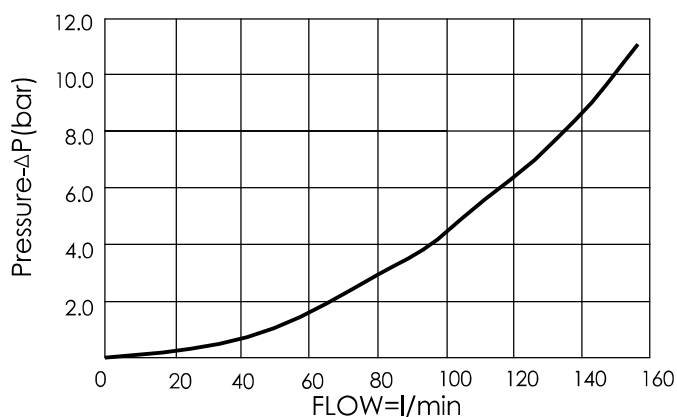
UNIT:mm



TECHNICAL DATA

Max. pressure:	350	bar
Rated Flow:	126 l/min ($\Delta P=7$ bar)	See Performance Chart
Cavity-Tooling:	21E-2	
Installation torque:	70-90	Nm
Weight:	0.33	kg

FULLY OPEN RESTRICTOR-FLOW IN BOTH DIRECTIONS

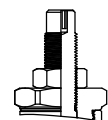


X OPERATION

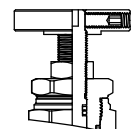
20 Needle Valve

Z OPTIONS

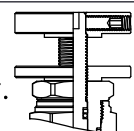
L Leakproof hex.
socket screw.



E Handknob and
locknut.



B Handknob and
aluminum locknut.



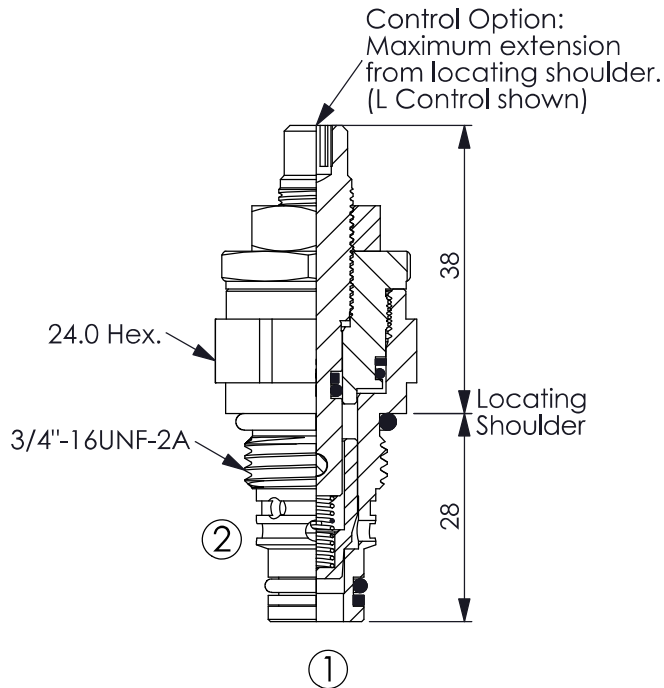
Y SPRING RANGE

N (Standard)

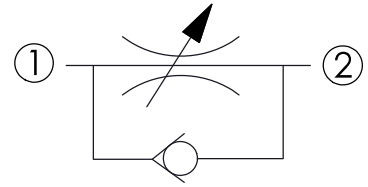
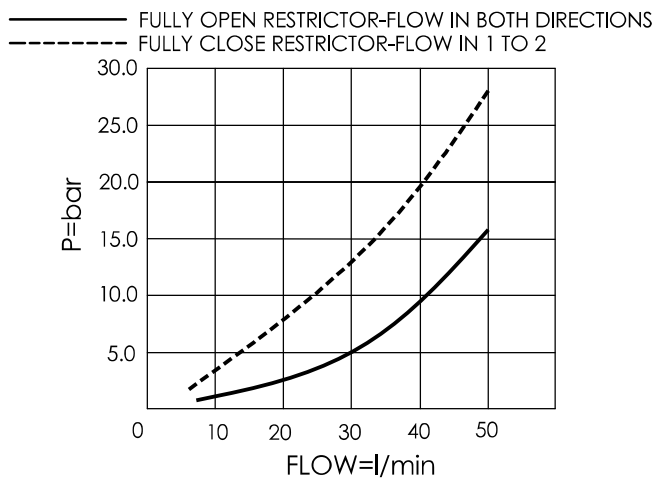
FLOW CONTROL VALVE

(With Reverse Flow Check)

Ordering Code: **NC-08W-X-Y-Z**



UNIT:mm



TECHNICAL DATA

Max. pressure:	350	bar
Rated Flow:	35 l/min ($\Delta P=7$ bar) See Performance Chart	
Cavity-Tooling:	08W-2	
Installation torque:	25-35	Nm
Weight:	0.12	kg

X OPERATION

20 1 to 2 (Free Flow)

Z OPTIONS

L	Leakproof hex. socket screw.	
E	Handknob and locknut.	
B	Handknob and aluminum locknut.	

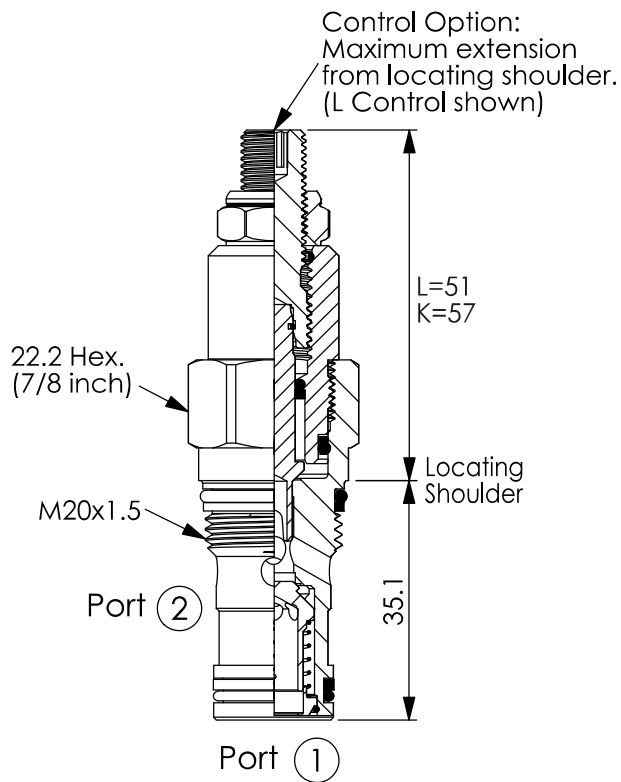
Y SPRING RANGE

N (Standard)

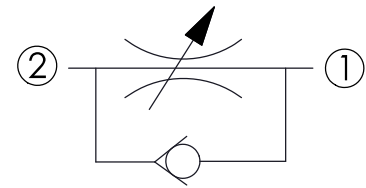
FLOW CONTROL VALVE

(With reverse flow check)

Ordering Code: **NC-13A-X-Y-Z**



UNIT:mm



TECHNICAL DATA

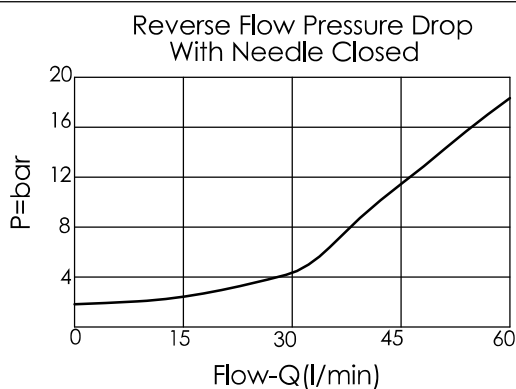
Max.Operating pressure: 350 bar

Rated flow:36 l/min ($\Delta P=7$ bar)
See Performance Chart

Cavity-Tooling: 13A-2

Installation torque: 40-50 Nm

Weight: 0.14 kg



X OPERATION

21 Standard Type

Y

SPRINGS

Maximum
Nominal Orifice

Cracking Pressure

BA

4.8 mm

0.3 bar

BC

4.8 mm

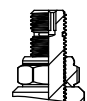
2.0 bar

Z

OPTIONS

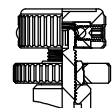
L

Leakproof hex.
socket screw.



K

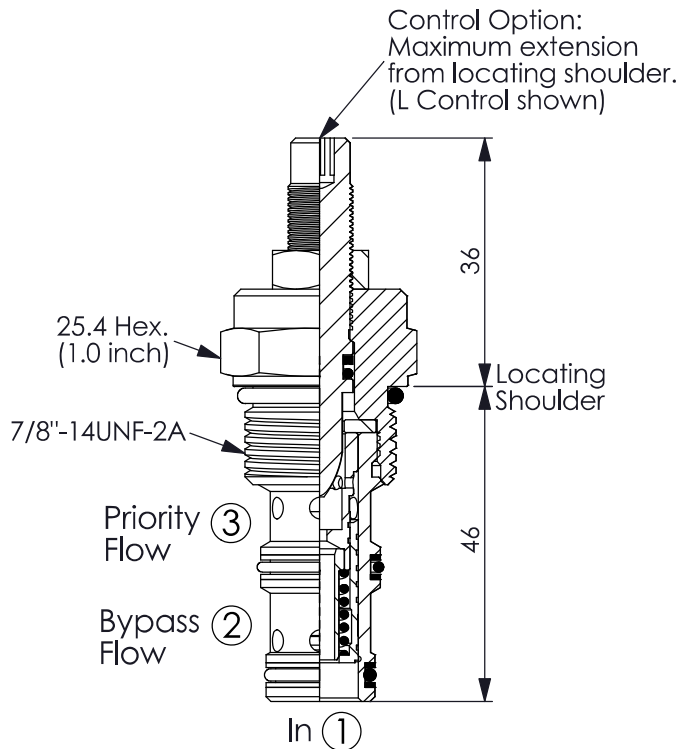
Handknob with
Lock Konb.



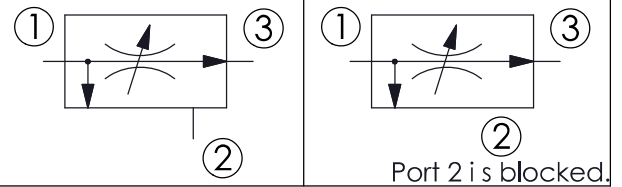
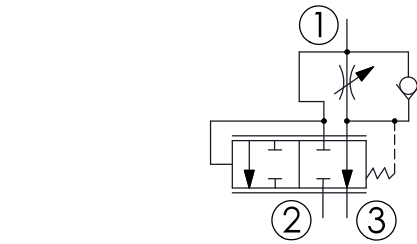
PRIORITY FLOW CONTROL VALVE

(Bypass/Pressure compensated)

Ordering Code: **FR-10W-X-Y-Z**



UNIT:mm



TECHNICAL DATA

Max. pressure: 240 bar

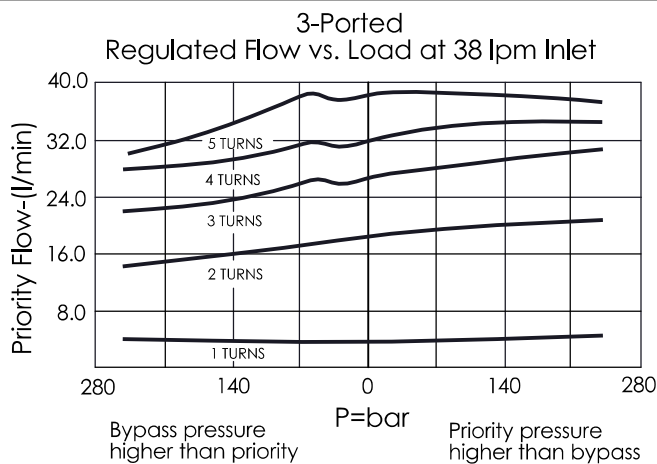
Rated Input Flow:
3-ported : 0-38 lpm nominal
0-57 lpm max.

Cavity-Tooling: 10W-3

Installation torque: 35-45 Nm

Weight: 0.14 kg

Note: It can be used as a priority-type flow regulator or a restrictive-type 2-way flow regulator when the bypass port (port 2) is blocked.



X PRIORITY FLOW RANGE

33

Flow Rate :

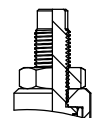
3-ported regulated flow 0-38 lpm
2-ported regulated flow 0-34 lpm

For Lower flow rates, see the FR-10W-31 valve

Z OPTIONS

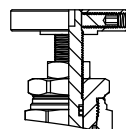
L

Leakproof hex. socket screw.



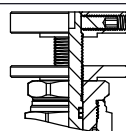
E

Handknob and locknut.



B

Handknob and aluminum locknut.



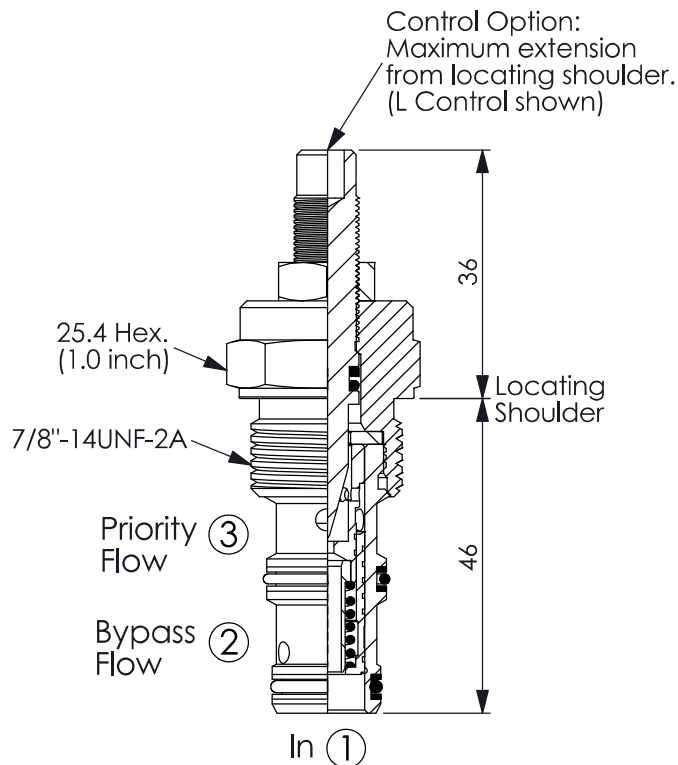
Y SPRING RANGE

N (Standard)

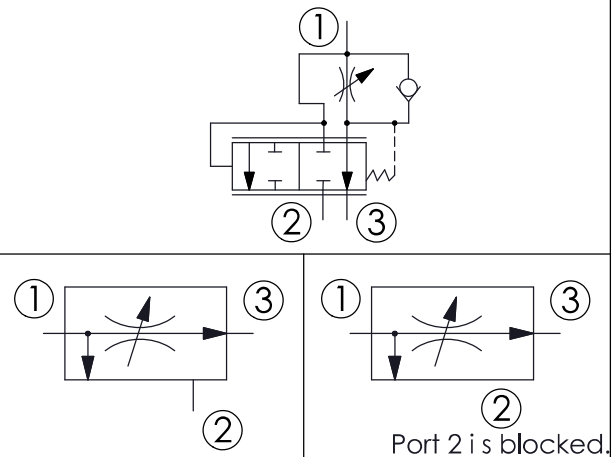
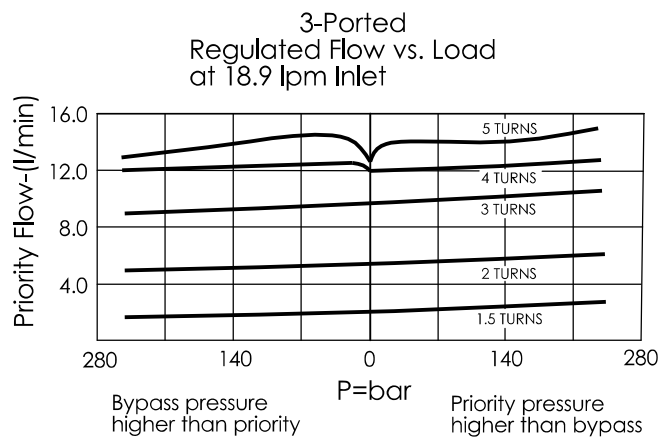
PRIORITY FLOW CONTROL VALVE

(Bypass/Pressure compensated)

Ordering Code: **FR-10W-X-Y-Z**



UNIT:mm



TECHNICAL DATA

Max. pressure: 240 bar

Rated Input Flow:

3-ported : 0-19 lpm nominal
0-26 lpm max.

Cavity-Tooling: 10W-3

Installation torque: 35-45 Nm

Weight: 0.14 kg

Note: It can be used as a priority-type flow regulator or a restrictive-type 2-way flow regulator when the bypass port (port 2) is blocked.

X PRIORITY FLOW RANGE

31

Flow Rate :

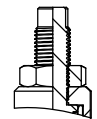
3-ported regulated flow 0-13 lpm
2-ported regulated flow 0-12 lpm

For Higher flow rates, see the FR-10W-33 valve

Z OPTIONS

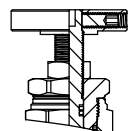
L

Leakproof hex. socket screw.



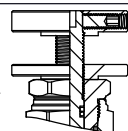
E

Handknob and locknut.



B

Handknob and aluminum locknut.



Y

SPRING RANGE

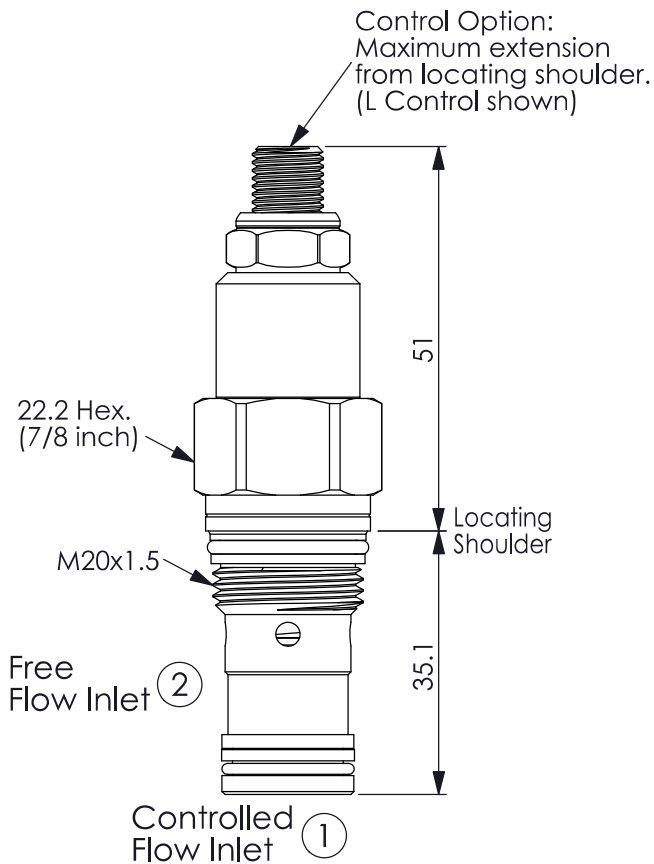
N

(Standard)

FLOW CONTROL VALVE

(Fully adjustable pressure compensated flow control valve with reverse flow check)

Ordering Code: **FR-13A-X-Y-Z**



UNIT:mm

TECHNICAL DATA

Max. pressure: 350 bar

Rated flow: 23 l/min

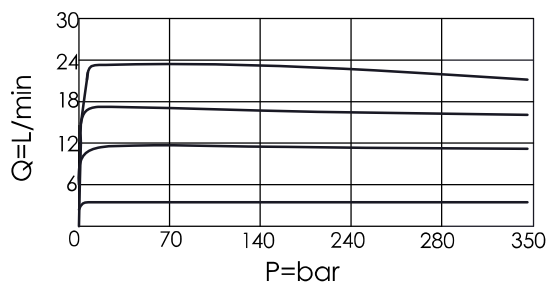
Cavity-Tooling: 13A-2

Installation torque: 40-50 Nm

Weight: 0.14 kg

Accurate pressure compensated control requires that a 200 psi (14 bar) minimum pressure differential be maintained across the valve.

Typical Performance



X OPERATION

20 Standard Type

Y

SPRINGS

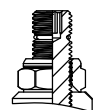
ADJUSTMENT RANGES

A

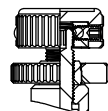
0.4 to 23 LPM

Z OPTIONS

L Leakproof hex. socket screw.



K Handknob with Lock Knob.



FLOW CONTROL VALVE

(Fully adjustable pressure compensated flow control valve with reverse flow check)

Ordering Code:

FR-5A-X-Y-Z

Control Option:
Maximum extension
from locating shoulder.
(L Control shown)

28.5 Hex.
(1 1/8 inch)

1.00-14UNS-2A

Free Flow Inlet ②

Controlled Flow Inlet ①

60

41.1

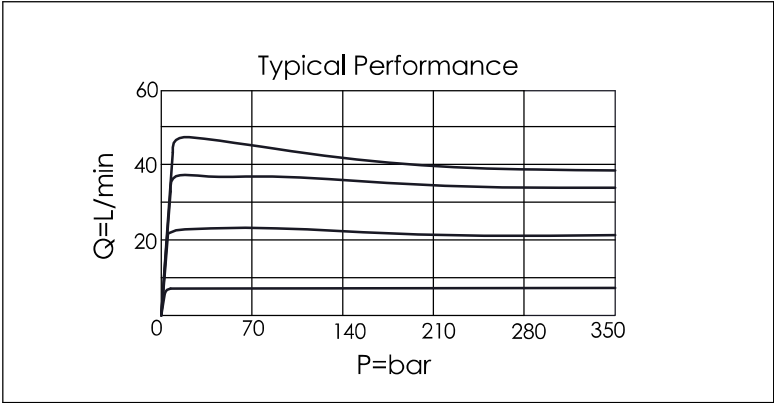
Locating Shoulder

UNIT:mm

TECHNICAL DATA

Max. pressure:	350	bar
Rated flow:	45	l/min
Cavity-Tooling:	5A-2	
Installation torque:	60-70	Nm
Weight:	0.27	kg

Accurate pressure compensated control requires that a 200 psi (14 bar) minimum pressure differential be maintained across the valve.



X	OPERATION	
20	Standard Type	

Y	SPRINGS	
	ADJUSTMENT RANGES	
A	0.4 to 45 LPM	

Z	OPTIONS	
L	Leakproof hex. socket screw.	
K	Handknob with Lock Konb.	

**(Fully adjustable pressure compensated
flow control valve with reverse flow check)**

Control Option: Maximum extension from locating shoulder. (L Control shown)

66

31.7 Hex. (1 1/4 inch)

Locating Shoulder

M36x2

62

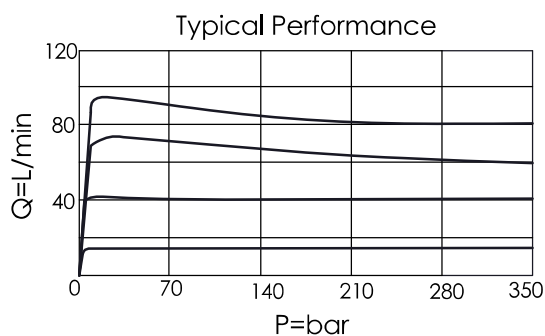
Free Flow Inlet (2)

Controlled Flow Inlet (1)

TECHNICAL DATA

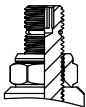
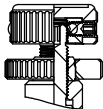
Max. pressure:	350	bar
Rated flow:	95	l/min
Cavity-Tooling:	16A-2	
Installation torque:	200-215	Nm
Weight:	0.52	kg

Accurate pressure compensated control requires that a 200 psi (14 bar) minimum pressure differential be maintained across the valve.



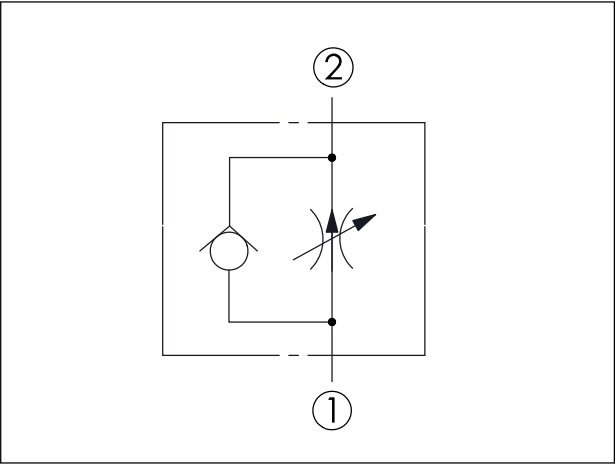
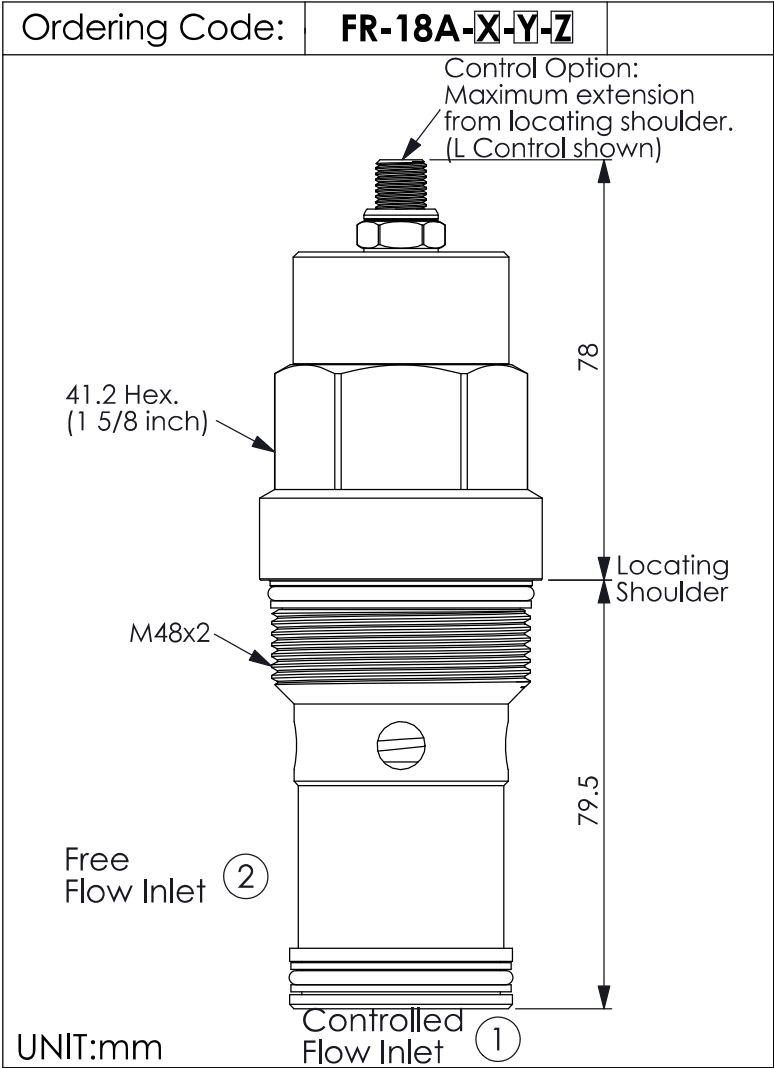
X	OPERATION	
20	Standard Type	

Y	SPRINGS	
	ADJUSTMENT RANGES	
A	0.8 to 95 LPM	

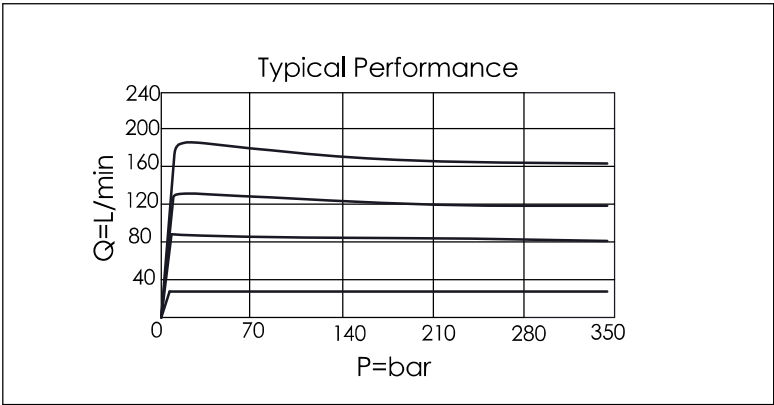
Z	OPTIONS	
L	Leakproof hex. socket screw.	
K	Handknob with Lock Konb.	

FLOW CONTROL VALVE

(Fully adjustable pressure compensated flow control valve with reverse flow check)

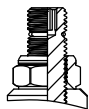
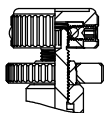


TECHNICAL DATA		
Max. pressure:	350	bar
Rated flow:	200	l/min
Cavity-Tooling:	18A-2	
Installation torque:	465-500	Nm
Weight:	1.22	kg
Accurate pressure compensated control requires that a 200 psi (14 bar) minimum pressure differential be maintained across the valve.		



X	OPERATION	
20	Standard Type	

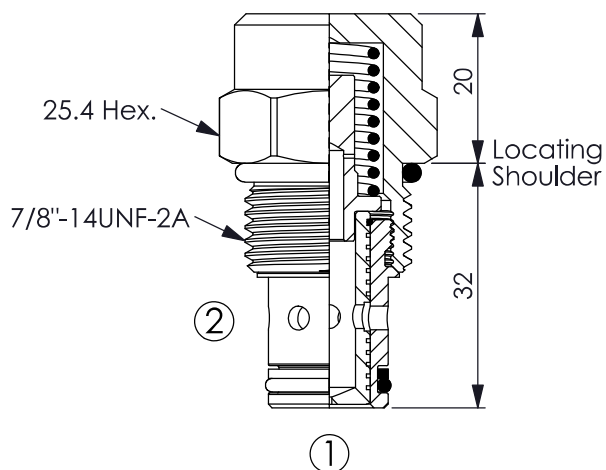
Y	SPRINGS	
	ADJUSTMENT RANGES	
A	1.0 to 200 LPM	

Z	OPTIONS	
L	Leakproof hex. socket screw.	
K	Handknob with Lock Konb.	

FLOW CONTROL VALVE

(Regulator, Pressure-Compensated)

Ordering Code: **FR-10W-X-Y-Z**

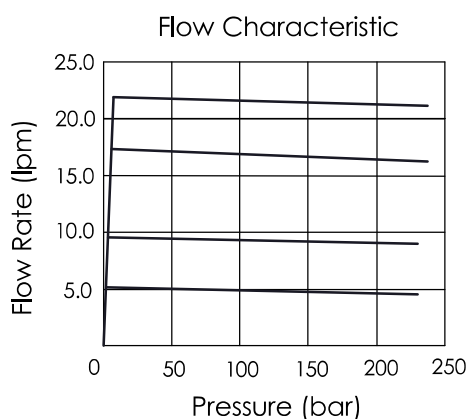


UNIT:mm



TECHNICAL DATA

Max. pressure:	240	bar
Rated Flow:	23	l/min
Cavity-Tooling:	10W-2	
Installation torque:	35-45	Nm
Weight:	0.12	kg



X OPERATION

20 Standard Type

Z OPTION

N Non-adjustable

Y SPRING RANGE

18 1.8 LPM

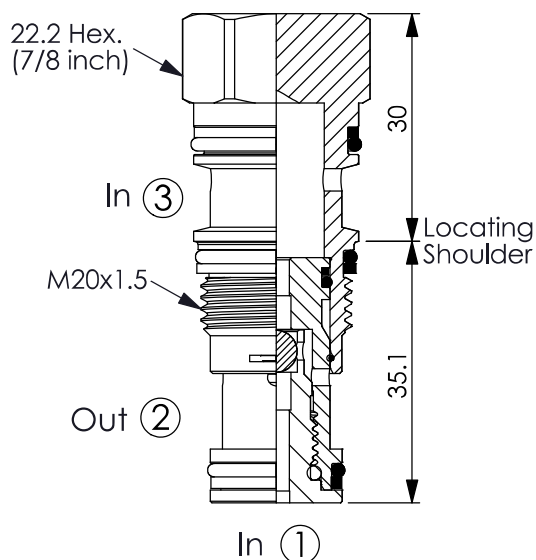
50 5.0 LPM

Setting in LPM
Specify for example:
18=1.8 LPM
50=5.0 LPM
etc. 0.4 LPM,Min.,23 LPM,Max.

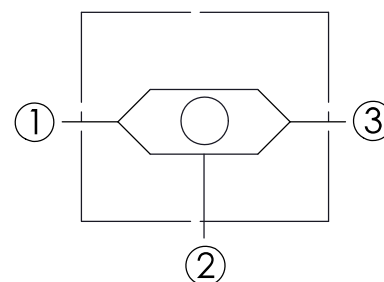
SHUTTLE VALVE

(Single ball shuttle valve with signal at port 2)

Ordering Code: **LS-11A-X-Y-Z**

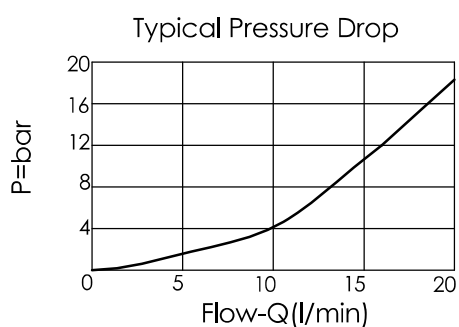


UNIT:mm



TECHNICAL DATA

Max. pressure:	350	bar
Rated flow:	10	l/min
Cavity-Tooling:	11A-3	
Installation torque:	40-50	Nm
Weight:	0.1	kg



X OPERATION

30 Signal at Port 2 (Standard)

Y SPRING

Cracking pressure

N Non-Springs

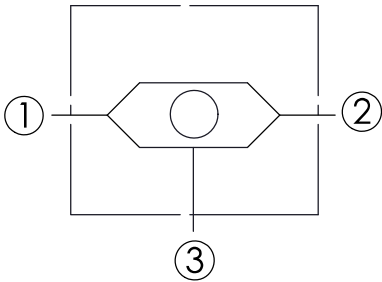
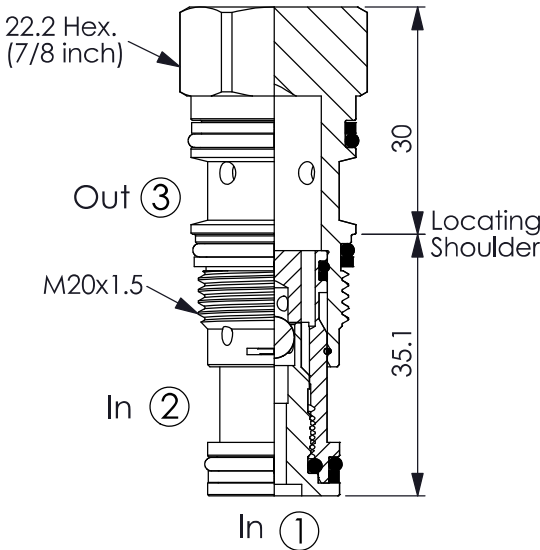
Z OPTION

N Non-adjustable

SHUTTLE VALVE

(Single ball shuttle valve with signal at port 3)

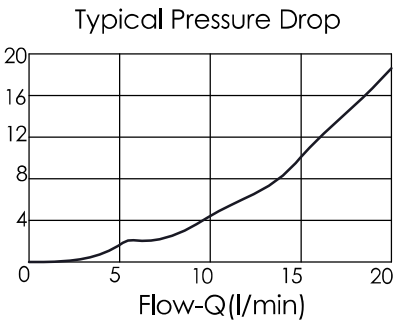
Ordering Code: **LS-11A-X-Y-Z**



TECHNICAL DATA

Max. pressure:	350	bar
Rated flow:	10	l/min
Cavity-Tooling:	11A-3	
Installation torque:	40-50	Nm
Weight:	0.11	kg

UNIT:mm



X OPERATION

33 Signal at Port 3

Y SPRING

Cracking pressure

N Non-Springs

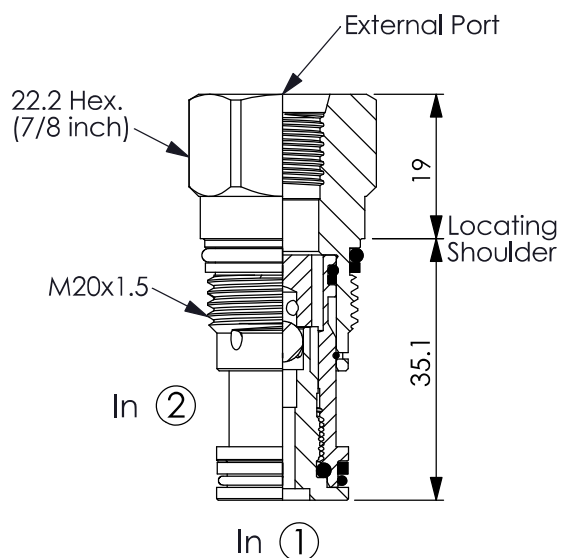
Z OPTION

N Non-adjustable

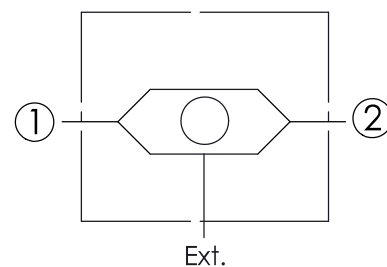
SHUTTLE VALVE

(Single ball shuttle valve with Signal at External Port)

Ordering Code: **LS-13A-X-Y-Z**



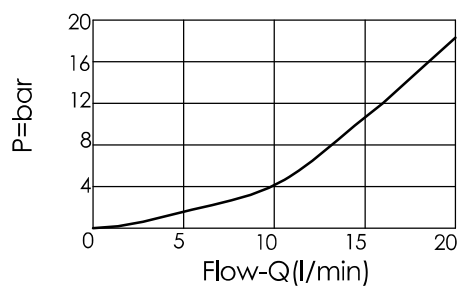
UNIT:mm



TECHNICAL DATA

Max. pressure:	350	bar
Rated flow:	10	l/min
Cavity-Tooling:	13A-2	
Installation torque:	40-50	Nm
Weight:	0.1	kg

Typical Pressure Drop



X OPERATION

20 Signal at External Port

Y SPRING

Cracking pressure

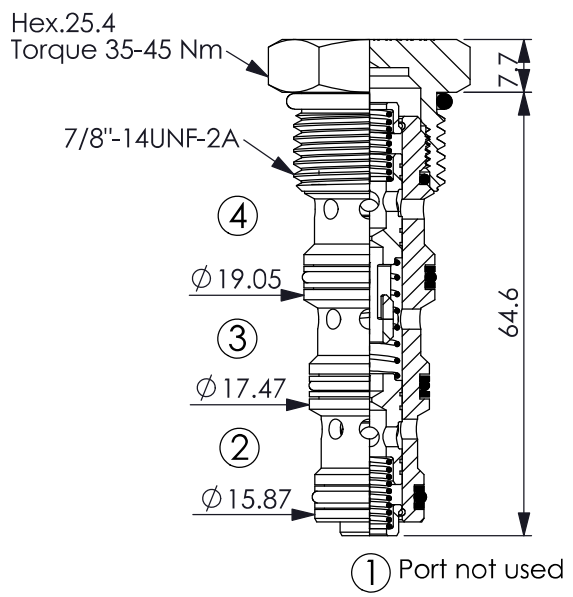
N Non-Springs

Z OPTION

S04 External SAE-4 Port
(7/16"-20UNF-2B)

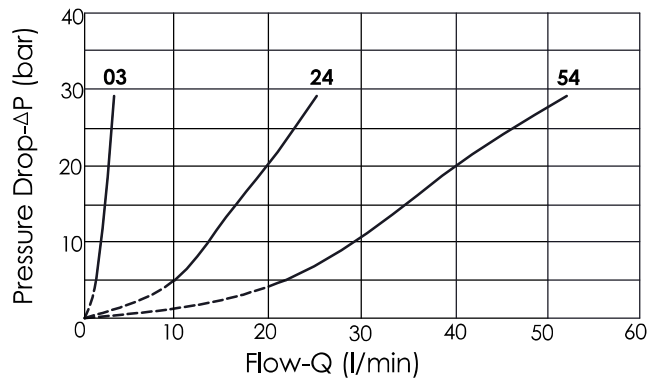
FLOW DIVIDER/COMBINER VALVES

Ordering Code: **FD-10W-X-Y-Z**

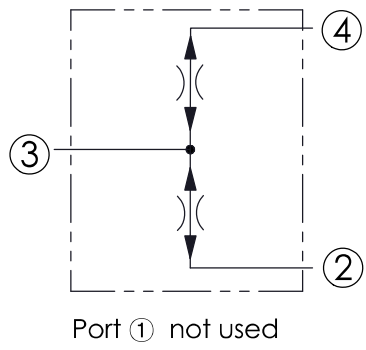


UNIT:mm

- (1)The FD10W-40 will divide input flow from③to②and④, based on the ratio specified,regardless of operating pressure.
- (2)The valve will combine input flow from both②and④to③.
- (3)Should either②or④ become blocked in flow division mode.



Y	MAX. INPUT FLOW	
03	1.2- 3 LPM	Ratio 50:50
06	3- 6 LPM	Ratio 50:50
13	6-13 LPM	Ratio 50:50
24	10-24 LPM	Ratio 50:50
37	15-37 LPM	Ratio 50:50
44	18-44 LPM	Ratio 50:50
54	22-54 LPM	Ratio 50:50
Other ratio options available;consult factory		



TECHNICAL DATA

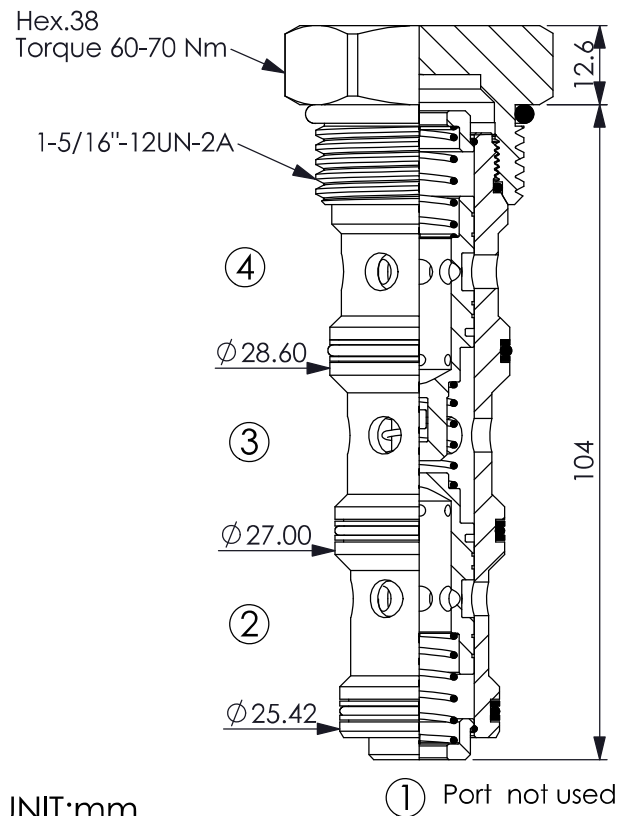
Pressure min-max:	10-350 bar
28 bar pressure drop at max.flow	
Rated Input Flow:	54 l/min
Cavity-Tooling:	10W-4
Installation torque:	35-45 Nm
Weight:	0.11 kg
Fluids-Temperatures:	-40~120 °C
Flow Accuracy:	10% from 40-100% of Max.Input flow
Filtration:	25 μm nominal or better
Mounting Position:	unrestricted

X	OPERATION	
40	4 Ports; Flow Divider/Combiner	

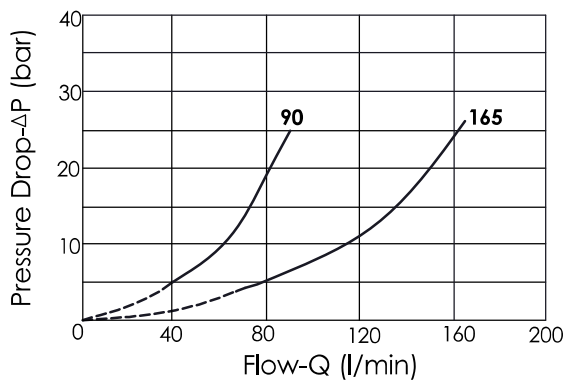
Z	OPTION	
N	Non-adjustable	

FLOW DIVIDER/COMBINER VALVES

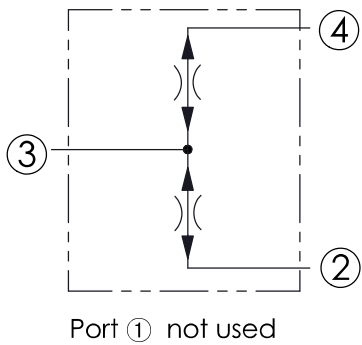
Ordering Code: **FD-16W-X-Y-Z**



- (1) The FD10W-40 will divide input flow from ③ to ② and ④, based on the ratio specified, regardless of operating pressure.
(2) The valve will combine input flow from both ② and ④ to ③.
(3) Should either ② or ④ become blocked in flow division mode.



Y	MAX. INPUT FLOW		
90	30-90 LPM	Ratio 50:50	
165	50-165 LPM	Ratio 50:50	
Other ratio options available; consult factory			



TECHNICAL DATA

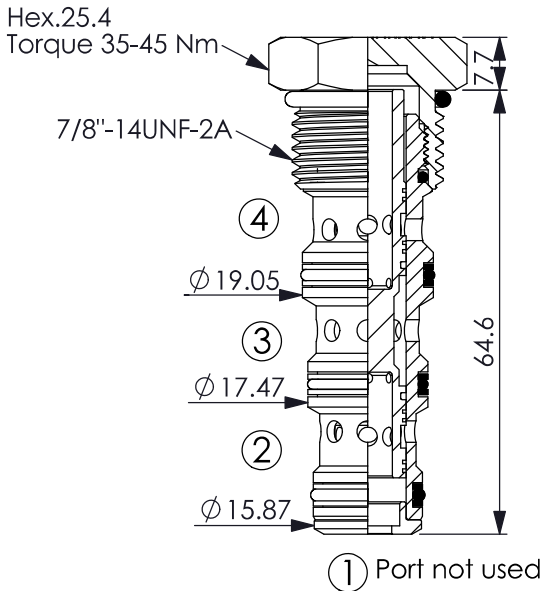
Pressure min-max:	10-350 bar
28 bar pressure drop at max.flow	
Rated Input Flow:	165 l/min
Cavity-Tooling:	16W-4
Installation torque:	60-70 Nm
Weight:	0.38 kg
Fluids-Temperatures:	-40~120 °C
Flow Accuracy:	10% from 40-100% of Max.Input flow
Filtration:	25 µm nominal or better
Mounting Position:	unrestricted

X	OPERATION	
40	4 Ports; Flow Divider/Combiner	

Z	OPTION	
N	Non-adjustable	

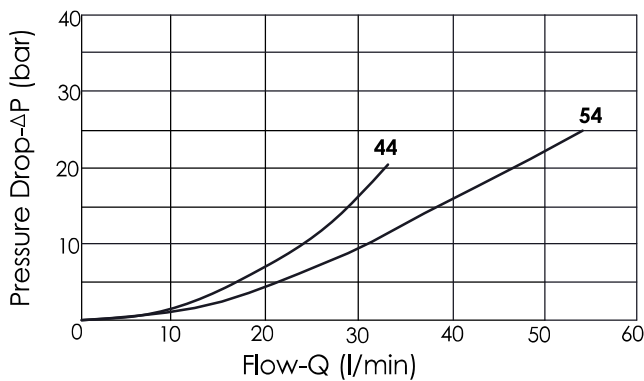
FLOW DIVIDER/COMBINER VALVES

Ordering Code: **FD-10W-X-Y-Z**

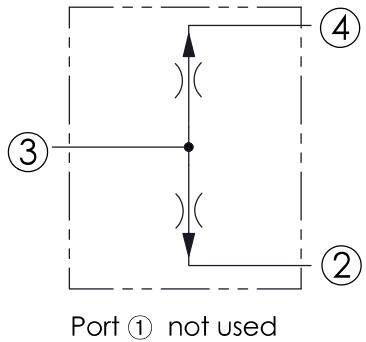


UNIT:mm

- (1)The FD10W-41 will divide input flow from③to②and④, based on the ratio specified,regardless of operating pressure.
 (2)Should either②or④become blocked in flow division mode.
 (3)NOTE:Flow combining is not permitted.



Y	MAX. INPUT FLOW
37	15-37 LPM Ratio 50:50
44	18-44 LPM Ratio 50:50
54	22-54 LPM Ratio 50:50
Other ratio options available;consult factory	



TECHNICAL DATA

Pressure min-max:	10-350 bar
28 bar pressure drop at max.flow	
Rated Input Flow:	54 l/min
Cavity-Tooling:	10W-4
Installation torque:	35-45 Nm
Weight:	0.11 kg
Fluids-Temperatures:	-40~120 °C
Flow Accuracy:	10% from 40-100% of Max.Input flow
Filtration:	25 μm nominal or better
Mounting Position:	unrestricted

X	OPERATION
41	4 Ports;Flow Divider

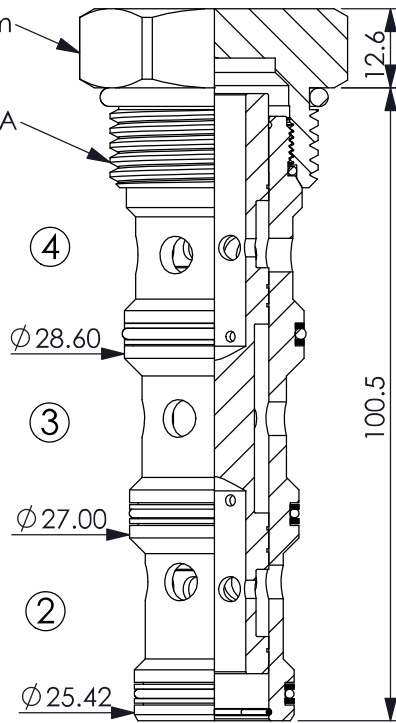
Z	OPTION
N	Non-adjustable 

FLOW DIVIDER VALVES

Ordering Code: **FD-16W-X-Y-Z**

Hex.38
Torque 60-70 Nm

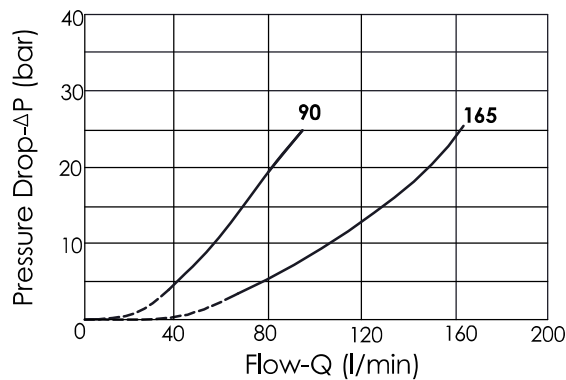
1-5/16"-12UN-2A



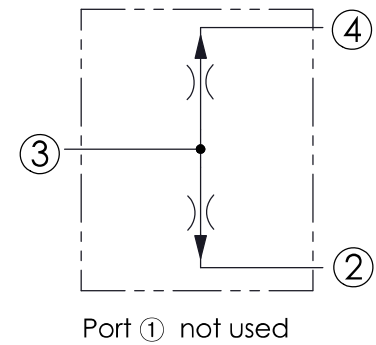
UNIT:mm

① Port not used

- (1)The FD16W-41 will divide input flow from ③ to ② and ④, based on the ratio specified, regardless of operating pressure.
(2)Should either ② or ④ become blocked in flow division mode.
(3)NOTE:Flow combining is not permitted.



Y	MAX. INPUT FLOW		
90	30-90 LPM	Ratio 50:50	
165	50-165 LPM	Ratio 50:50	
Other ratio options available;consult factory			



TECHNICAL DATA

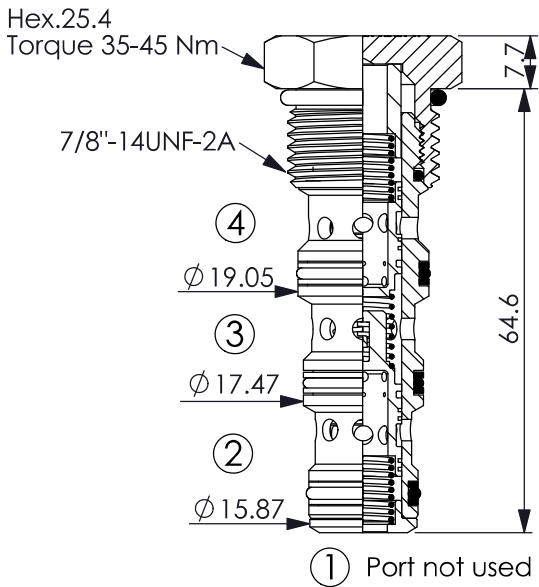
Pressure min-max:	10-350 bar
28 bar pressure drop at max.flow	
Rated Input Flow:	165 l/min
Cavity-Tooling:	16W-4
Installation torque:	60-70 Nm
Weight:	0.38 kg
Fluids-Temperatures:	-40~120 °C
Flow Accuracy:	10% from 40-100% of Max.Input flow
Filtration:	25 μm nominal or better
Mounting Position:	unrestricted

X	OPERATION	
41	4 Ports;Flow Divider	

Z	OPTION	
N	Non-adjustable	

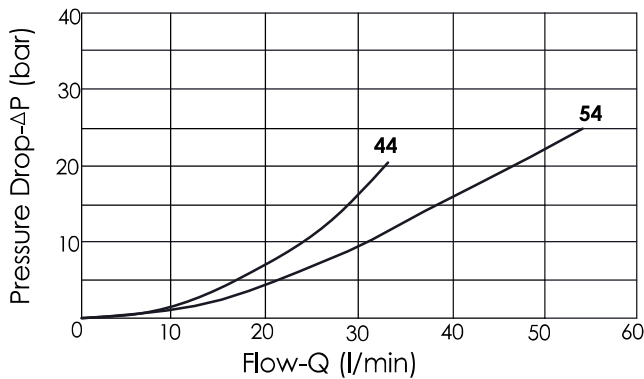
FLOW DIVIDER/COMBINER VALVES
(ANTI-STALL FEATURES)

Ordering Code: **FD-10W-X-Y-Z**

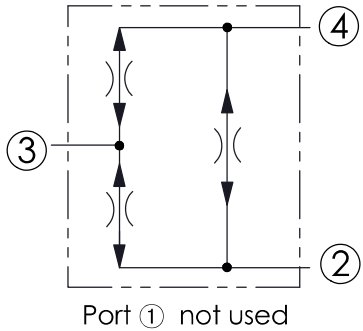


UNIT:mm

- (1)The FD10W-42 will divide input flow from③to②and④, based on the ratio specified,regardless of operating pressure.
(2)The valve wil combin input flow from both②and④to③ .
(3)The FD10W-42 will keep a flow to both combining ports②and④ when port ② or ④ is "free-wheeling." This function keeps parallel hydraulic-motor drive circuits from stalling in the combining mode.



Y	MAX. INPUT FLOW	
37	15-37 LPM	Ratio 50:50
44	18-44 LPM	Ratio 50:50
54	22-54 LPM	Ratio 50:50
Other ratio options available;consult factory		



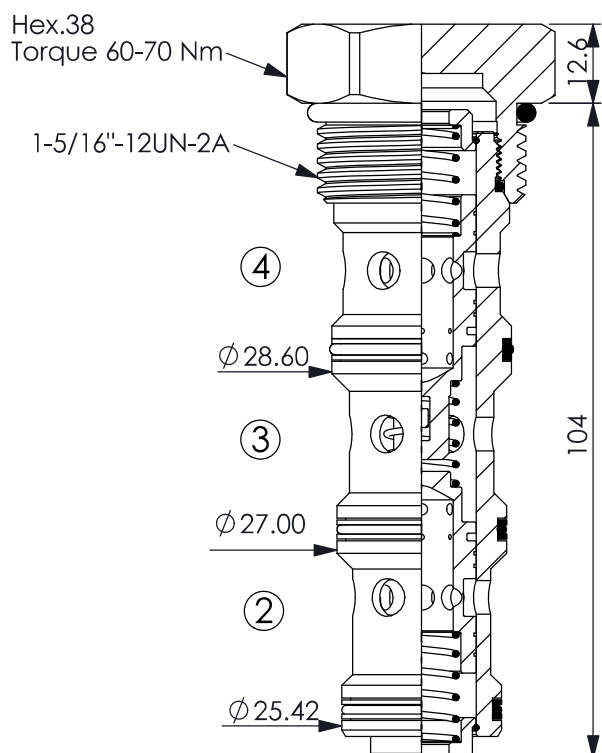
TECHNICAL DATA

Pressure min-max:	10-350	bar
28 bar pressure drop at max.flow		
Rated Input Flow:	54	l/min
Cavity-Tooling:	10W-4	
Installation torque:	35-45	Nm
Weight:	0.11	kg
Fluids-Temperatures:	-40~120	°C
Flow Accuracy:	10% from 40-100% of Max.Input flow	
Filtration:	25 μ m nominal or better	
Mounting Position:	unrestricted	

X	OPERATION	
42	4 Ports; Flow Divider/Combiner (Anti-Stall Features)	
Z	OPTION	
N	Non-adjustable	

FLOW DIVIDER/COMBINER VALVES (ANTI-STALL FEATURES)

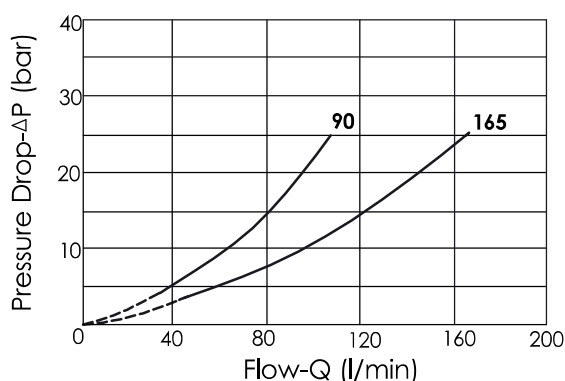
Ordering Code:	FD-16W-X-Y-Z
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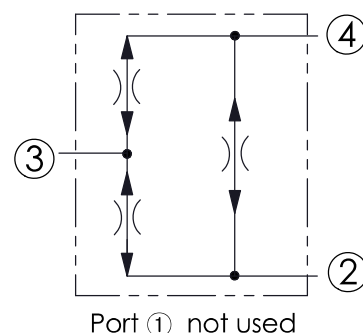
UNIT:mm

① Port not used

- (1) The FD16W-42 will divide input flow from ① to ② and ③, based on the ratio specified, regardless of operating pressure.
- (2) The valve will combine input flow from both ② and ③ to ①.
- (3) The FD16W-42 will keep a flow to both combining ports ② and ③ when port ① or ④ is "free-wheeling." This function keeps parallel hydraulic motor drive circuits from stalling in the combining mode.



Y	MAX. INPUT FLOW		
90	30-90 LPM	Ratio 50:50	
165	50-165 LPM	Ratio 50:50	
Other ratio options available;consult factory			



TECHNICAL DATA

Pressure min-max: 10-350 bar
28 bar pressure drop at max.flow

Rated Input Flow: 165 l/min

Cavity-Tooling: 16W-4

Installation torque:	60-70	Nm
----------------------	-------	----

Weight: 0.38 kg

Fluids-Temperatures: -40~120 °C

Flow Accuracy: 10% from 40-100%
of Max.Input flow

Filtration: 25 µm nominal or better

Mounting Position: unrestricted

X	OPERATION	
42	4 Ports; Flow Divider/Combiner (Anti-Stall Features)	

Z	OPTION	
N	Non-adjustable 	

CHECK VALVE
(Pilot-To-Close)

Ordering Code: **CC-11A-X-Y-Z**

22.2 Hex.
(7/8 inch)

Pilot (3)

M20x1.5

Out (2)

In (1)

Locating Shoulder

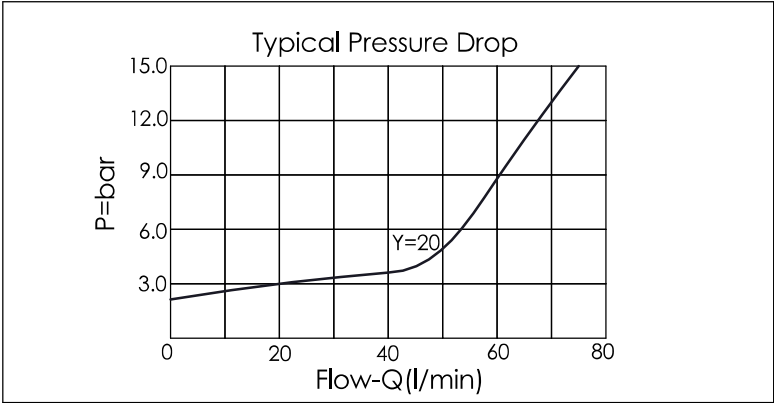
30

35.1

UNIT:mm

(1) (2) (3)

TECHNICAL DATA		
Max. pressure:	350	bar
Rated flow:	80	l/min
Cavity-Tooling:	11A-3	
Installation torque:	40-50	Nm
Weight:	0.13	kg



X	OPERATION	
30	1 to 2 (Free Flow)	

Y	SPRINGS	
	Cracking pressure	
03	0.3 bar	
20	2.0 bar	
50	5.0 bar	

Z	OPTION	
N	Non-adjustable	

CHECK VALVE
(Pilot-To-Close)

Ordering Code: **CC-2A-X-Y-Z**

28.5 Hex.
(1 1/8 inch)

Pilot ③

1.00-14UNS-2A

Out ②

In ①

35

35.1

Locating Shoulder

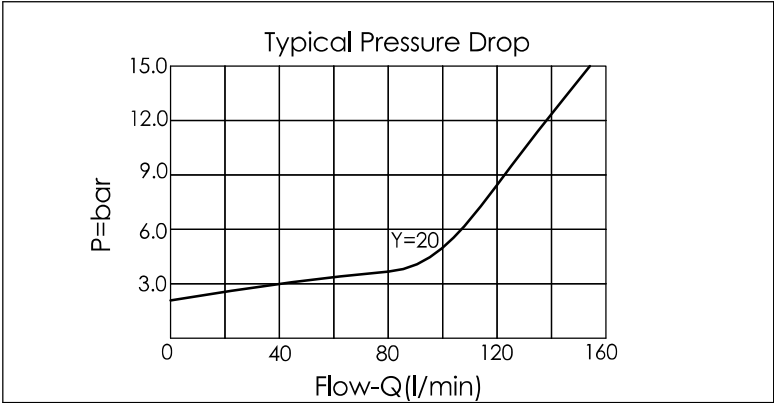
UNIT:mm

①

②

③

TECHNICAL DATA		
Max. pressure:	350	bar
Rated flow:	160	l/min
Cavity-Tooling:	2A-3	
Installation torque:	60-70	Nm
Weight:	0.23	kg



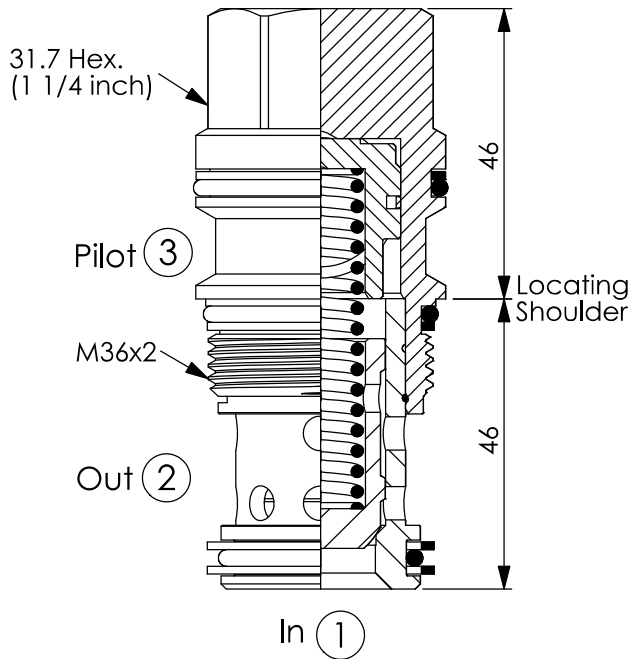
X	OPERATION	
30	1 to 2 (Free Flow)	

Y	SPRINGS	
	Cracking pressure	
03	0.3 bar	
20	2.0 bar	
50	5.0 bar	

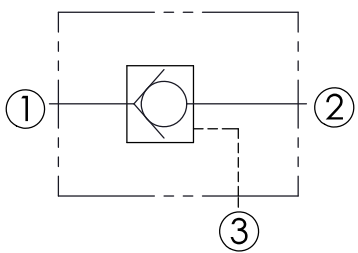
Z	OPTION	
N	Non-adjustable	

CHECK VALVE
(Pilot-To-Close)

Ordering Code: CC-17A-X-Y-Z

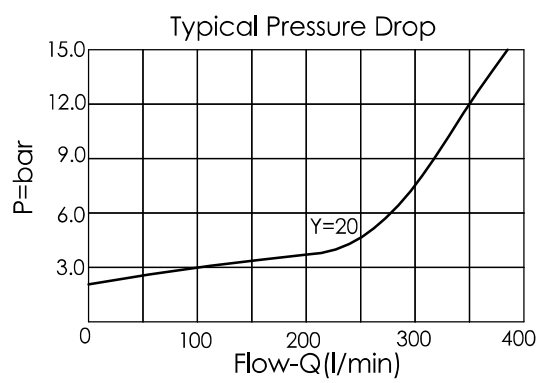


UNIT:mm



TECHNICAL DATA

Max. pressure:	350	bar
Rated flow:	320	l/min
Cavity-Tooling:	17A-3	
Installation torque:	200-215	Nm
Weight:	0.50	kg



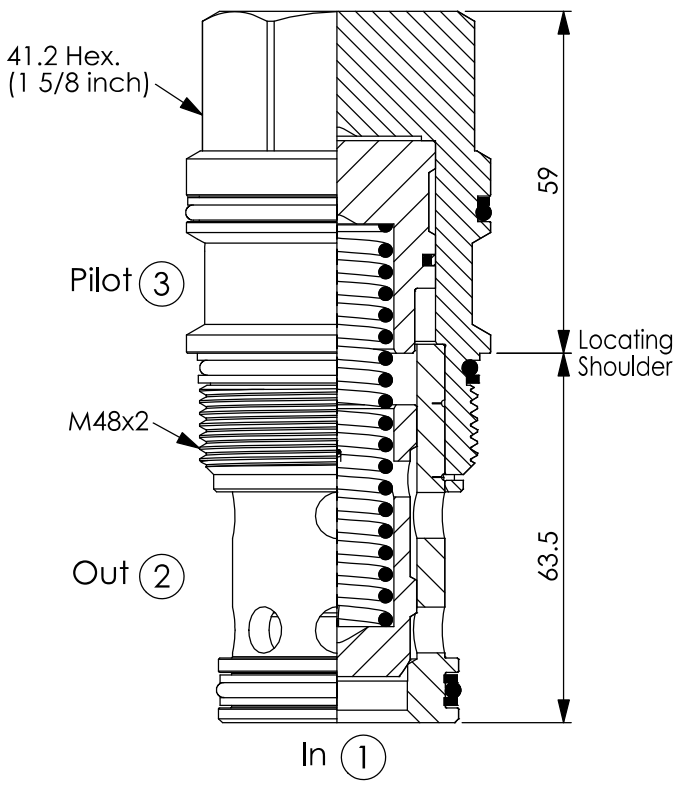
X	OPERATION	
30	1 to 2 (Free Flow)	

Y	SPRINGS	
	Cracking pressure	
03	0.3 bar	
20	2.0 bar	
50	5.0 bar	

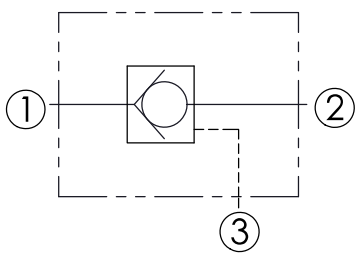
Z	OPTION	
N	Non-adjustable	

CHECK VALVE
(Pilot-To-Close)

Ordering Code: **CC-19A-X-Y-Z**

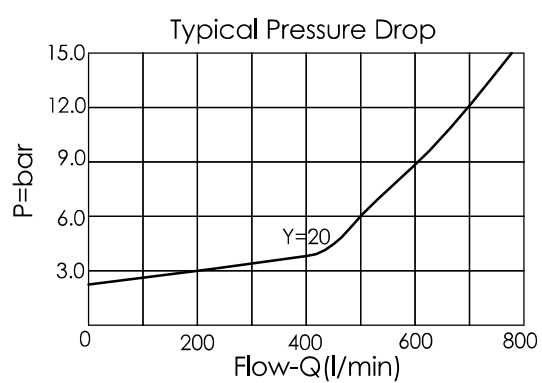


UNIT:mm



TECHNICAL DATA

Max. pressure:	350	bar
Rated flow:	640	l/min
Cavity-Tooling:	19A-3	
Installation torque:	465-500	Nm
Weight:	1.15	kg



X	OPERATION	
30	1 to 2 (Free Flow)	

Y	SPRINGS	
	Cracking pressure	
03	0.3 bar	
20	2.0 bar	
50	5.0 bar	

Z	OPTION	
N	Non-adjustable	

LOGIC ELEMENTS

(Normally Closed Modulating Element)

Ordering Code: **LR-11A-X-Y-Z**

22.2 Hex.
(7/8 inch)

Port ③

M20x1.5

Port ②

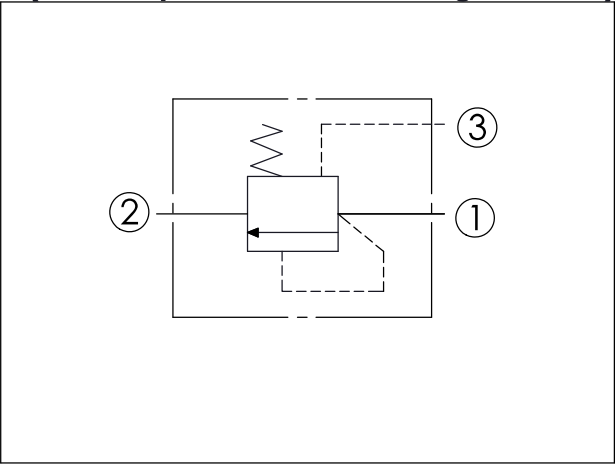
Port ①

30

35.1

Locating
Shoulder

UNIT:mm



TECHNICAL DATA		
Max. pressure:	350	bar
Rated flow:	6	l/min
Cavity-Tooling:	11A-3	
Installation torque:	40-50	Nm
Weight:	0.13	kg

--

X	OPERATION	
36	Max. Flow:6 LPM	

Y	SPRINGS	
	Cracking pressure	
35	3.5 bar	
70	7.0 bar	
100	10.0 bar	
140	14.0 bar	

Z	OPTION	
N	Non-adjustable	

LOGIC ELEMENTS

(Normally Closed Modulating Element)

Ordering Code: **LR-11A-X-Y-Z**

22.2 Hex.
(7/8 inch)

Port 3

M20X1.5

Port 2

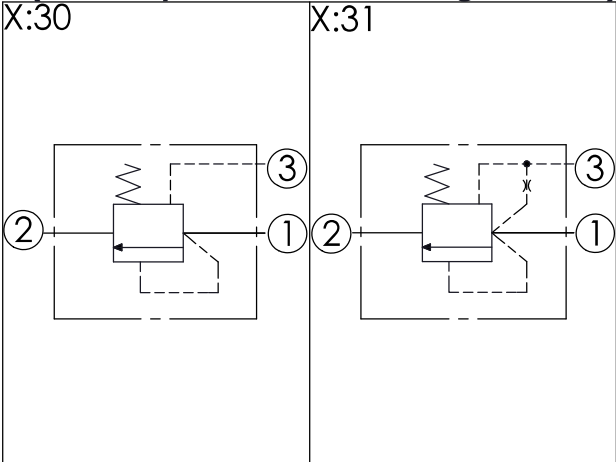
Port 1

30

35.1

Locating
Shoulder

UNIT:mm



TECHNICAL DATA		
Max. pressure:	350	bar
Rated flow:	60	l/min
Cavity-Tooling:	11A-3	
Installation torque:	40-50	Nm
Weight:	0.12	kg

--

X	OPERATION	
30	External Pilot	
31	Internal Pilot (Port 1 to Port 3)	

Y	SPRINGS	
	Cracking pressure	
35	3.5 bar	
70	7.0 bar	
100	10.0 bar	
140	14.0 bar	

Z	OPTION	
N	Non-adjustable	

LOGIC ELEMENTS

(Normally Closed Modulating Element)

Ordering Code: **LR-2A-X-Y-Z**

28.5 Hex.
(1 1/8 inch)

Port ③

1.00-14UNS-2A

Port ②

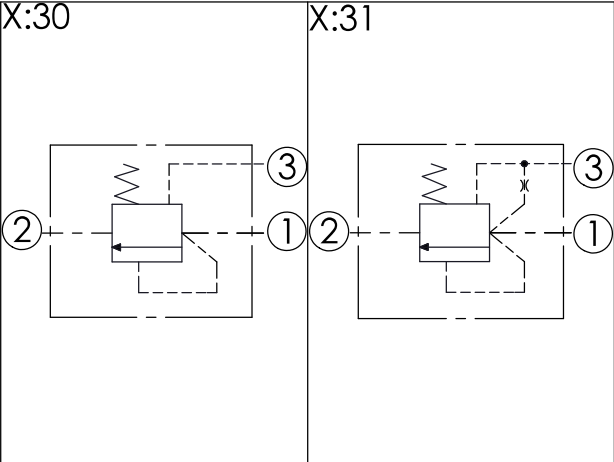
Port ①

35

35.1

Locating Shoulder

UNIT:mm



TECHNICAL DATA		
Max. pressure:	350	bar
Rated flow:	120	l/min
Cavity-Tooling:	2A-3	
Installation torque:	60-70	Nm
Weight:	0.22	kg

--

X	OPERATION	
30	External Pilot	
31	Internal Pilot (Port 1 to Port 3)	

Y	SPRINGS	
	Cracking pressure	
35	3.5 bar	
70	7.0 bar	
100	10.0 bar	
140	14.0 bar	

Z	OPTION	
N	Non-adjustable	

LOGIC ELEMENTS

(Normally Closed Modulating Element)

Ordering Code: **LR-17A-X-Y-Z**

31.7 Hex.
(1 1/4 inch)

Port ③

M36x2

Port ②

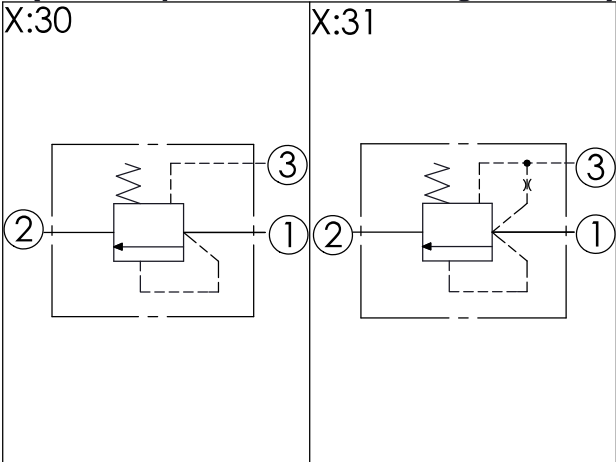
Port ①

46

Locating Shoulder

46

UNIT:mm



TECHNICAL DATA		
Max. pressure:	350	bar
Rated flow:	240	l/min
Cavity-Tooling:	17A-3	
Installation torque:	200-215	Nm
Weight:	0.48	kg

--

X	OPERATION	
30	External Pilot	
31	Internal Pilot (Port 1 to Port 3)	

Y	SPRINGS	
	Cracking pressure	
35	3.5 bar	
70	7.0 bar	
100	10.0 bar	
140	14.0 bar	

Z	OPTION	
N	Non-adjustable	

LOGIC ELEMENTS

(Normally Closed Modulating Element)

Ordering Code: **LR-19A-X-Y-Z**

41.2 Hex.
(1 5/8 inch)

Port ③

M48x2

Port ②

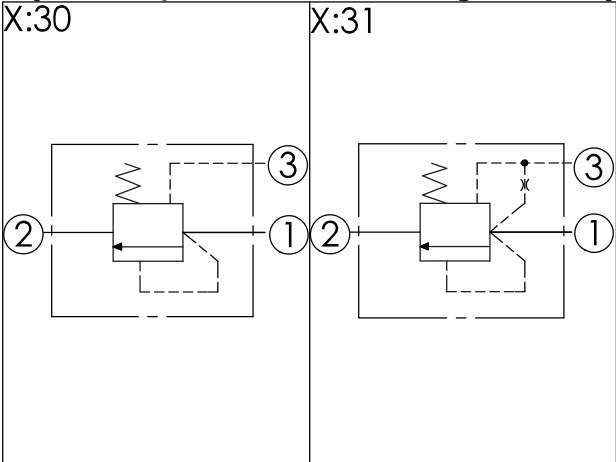
Port ①

59

63.5

Locating Shoulder

UNIT:mm



TECHNICAL DATA		
Max. pressure:	350	bar
Rated flow:	480	l/min
Cavity-Tooling:	19A-3	
Installation torque:	465-500	Nm
Weight:	1.19	kg

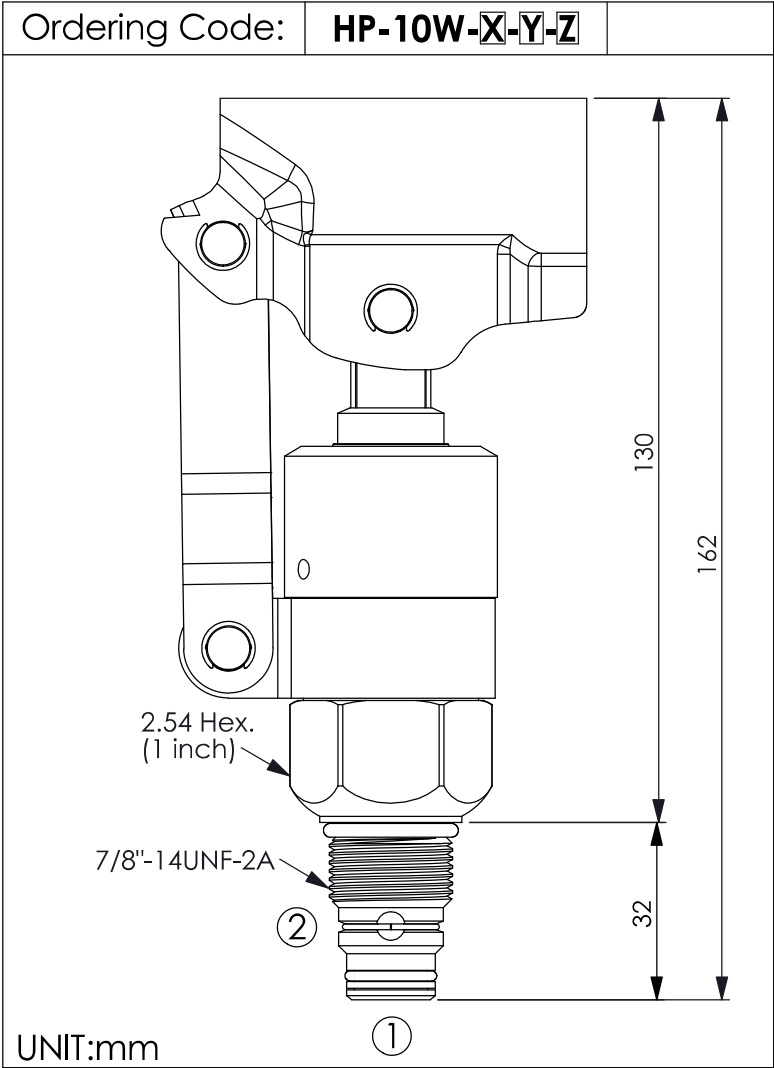
--

X	OPERATION	
30	External Pilot	
31	Internal Pilot (Port 1 to Port 3)	

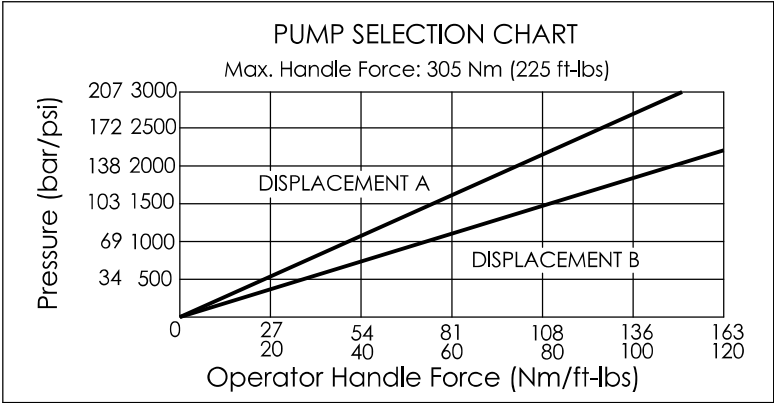
Y	SPRINGS	
	Cracking pressure	
35	3.5 bar	
70	7.0 bar	
100	10.0 bar	
140	14.0 bar	

Z	OPTION	
N	Non-adjustable	

HAND PUMP



TECHNICAL DATA		
Max. Operating Pressure: 210 bar		
Flow: Up to 10.6 c.c. per stroke		
Cavity-Tooling: 10W-2		
Installation torque: 35-45 Nm		
Weight: 0.83 kg		



Y	DISPLACEMENT	
A	7.4 c.c. per stroke	
B	10.6 c.c. per stroke	

X	OPERATION	
20	Push to pressurize	

Z	OPTION	
N	Non-adjustable	

CAVITY PLUGS

(A-type cavities)

Ordering Code: **CP-X-Y-Z**

Example: CP-5A-2H-00 Example: CP-5A-2H-12

X	CAVITY-THREADS
10A	M20x1.5
13A	M20x1.5
3A	1.00-14UNS-2B
5A	1.00-14UNS-2B
16A	M36x2.0
18A	M48x2.0

Y	PORTS
2H	2 Holes

[illegible]

CAVITY PLUGS

(A-type cavities)

Ordering Code: **CP-X-Y-Z**

Example:CP-2A-3H-00

Example:CP-2A-3H-12

X	CAVITY-THREADS
11A	M20x1.5
2A	1.00x14UNS-2B
17A	M36x2.0
19A	M48x2.0
Y	PORTS
3H	3 Holes

Z	OPERATIONS						
00	All Ports Blocked	11A	2A	17A	19A		
12	Ports 1 and 2 Open Other Ports Blocked	11A	2A	17A	19A		
13	Ports 1 and 3 Open Other Ports Blocked	11A	2A	17A	19A		
23	Ports 2 and 3 Open Other Ports Blocked	11A	2A	17A	19A		
123	Ports 1,2 and 3 Open	11A	2A	17A	19A		

CAVITY PLUGS

(A-type cavities)

Ordering Code: **CP-X-Y-Z**

Example: CP-22A-4H-00 Example: CP-22A-4H-12

① ② ③ ④

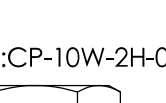
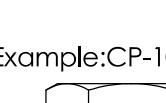
① ② ③ ④

X	CAVITY-THREADS
22A	1.00-14UNS-2A

Y	PORTS
4H	4 Holes

[illegible]

CAVITY PLUGS

Ordering Code: CP-X-Y-Z	
Example:CP-10W-2H-00  Example:CP-10W-2H-12 	
X	CAVITY-THREADS
08W	3/4"-16UNF-2B
10W	7/8"-14UNF-2B
12W	1 1/16"-12UN-2B
16W	1 5/16"12UN-2B
42W	M42x2.0
Y	PORTS
2H	2 Holes

[illegible]

CAVITY PLUGS

(W-type cavities)

Ordering Code: **CP-X-Y-Z**

Example: CP-10W-3H-00

Example: CP-10W-3H-13

X	CAVITY-THREADS
08W	3/4"-16UNF-2B
10W	7/8"-14UNF-2B
12W	1 1/16"-12UN-2B
16W	1 5/16"12UN-2B
Y	PORTS
3H	3 Holes

Z	OPERATIONS					
00	All Ports Blocked	08W	10W	12W	16W	
12	Ports 1 and 2 Open Other Ports Blocked	08W	10W	12W	16W	
13	Ports 1 and 3 Open Other Ports Blocked	08W	10W	12W	16W	
23	Ports 2 and 3 Open Other Ports Blocked	08W	10W	12W	16W	
123	Ports 1,2 and 3 Open Other Ports Blocked	08W	10W	12W	16W	
	PS. CP08W3H123 as same as CP08W2H12					

CAVITY PLUGS

(W-type cavities)

Ordering Code: **CP-X-Y-Z**

Example: CP-10W-4H-00 Example: CP-10W-4H-124

X	CAVITY-THREADS
08W	3/4"-16UNF-2B
10W	7/8"-14UNF-2B
12W	1 1/16"-12UN-2B
16W	1 5/16"12UN-2B
Y	PORTS
4H	4 Holes

Z	OPERATIONS					
00	All Ports Blocked	08W	10W	12W	16W	
12	Ports 1 and 2 Open Other Ports Blocked	08W	10W	12W	16W	
13	Ports 1 and 3 Open Other Ports Blocked	08W	10W	12W	16W	
23	Ports 2 and 3 Open Other Ports Blocked	08W	10W	12W	16W	
24	Ports 2 and 4 Open Other Ports Blocked	08W	10W	12W	16W	
34	Ports 3 and 4 Open Other Ports Blocked	08W	10W	12W	16W	
123	Ports 1,2 and 3 Open Other Ports Blocked	08W	10W	12W	16W	
124	Ports 1,2 and 4Open Other Ports Blocked	08W	10W	12W	16W	
234	Ports 2,3 and 4Open Other Ports Blocked	08W	10W	12W	16W	
1234	All Ports Open	08W	10W	12W	16W	
PS. CP08W4H1234 as same as CP08W2H12						
12-34	Ports 1 and 2 Open Ports 3 and 4 Open Ports 2 and 3 Blocked	08W	10W	12W	16W	

CAVITY PLUGS

Ordering Code: **CP-X-Y-Z**

Example: CP-17E-2H-00

Example: CP-17E-2H-12

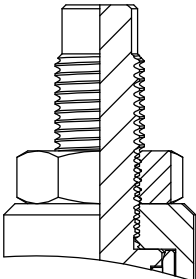
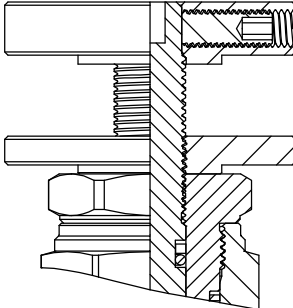
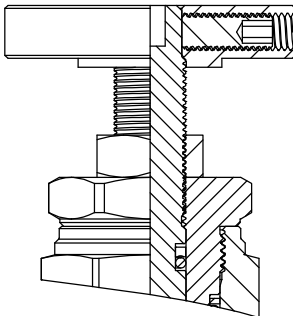
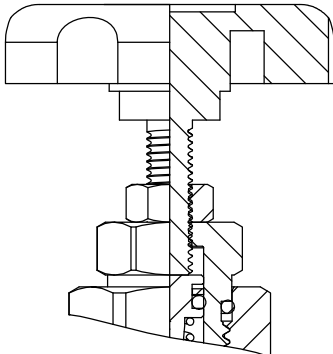
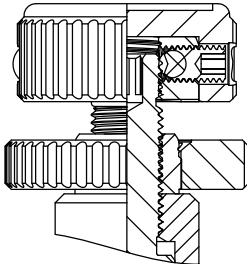
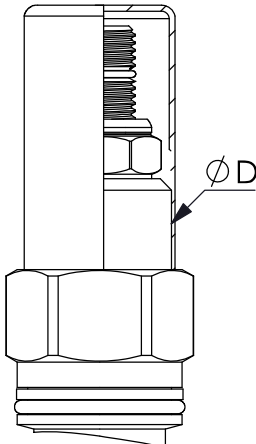
The image contains two technical cross-sectional diagrams of mechanical components. The left diagram, labeled 'Example: CP-17E-2H-00', shows a component with a hexagonal nut on top, a threaded section, and a flange. The right diagram, labeled 'Example: CP-17E-2H-12', shows a similar component but with a different internal profile. Both diagrams are labeled with circled numbers 1 and 2, indicating specific parts or features.

X	CAVITY-THREADS
19E	3/4"-16UNF-2B
17E	G 3/4"
21E	G 1"
04E	G 1 1/4"

Y	PORTS
2H	2 Holes

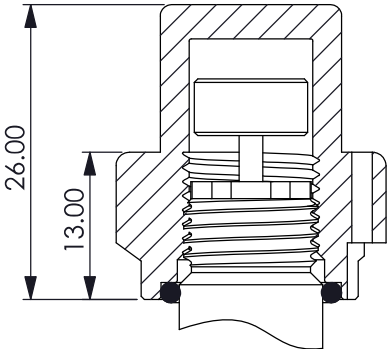
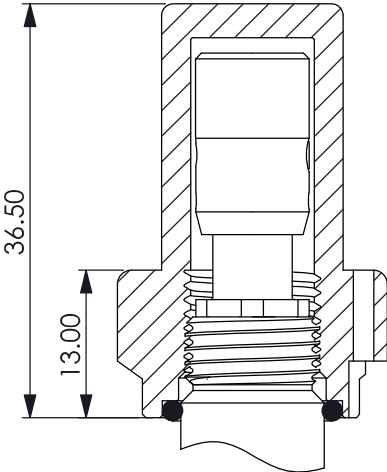
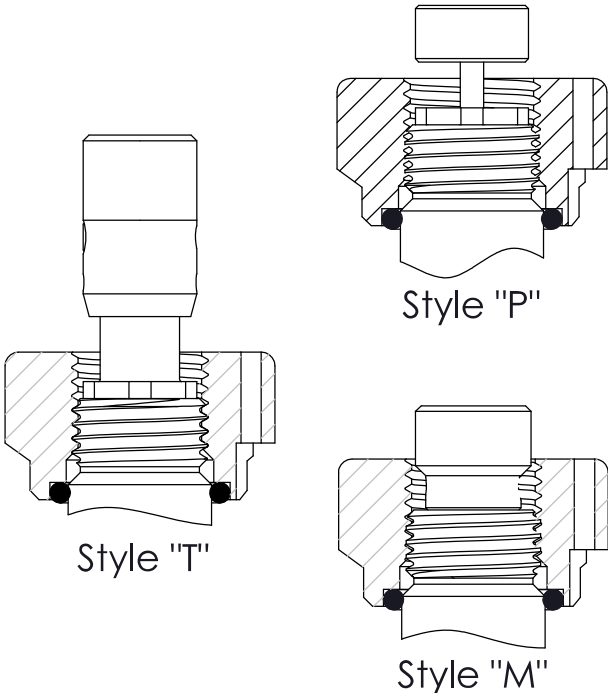
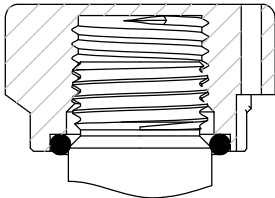
[illegible]

CARTRIDGE CONTROL OPTIONS

L Leakproof Hex.Socket Screw		B Handknob and Aluminum Locknut								
										
		<table><tr><td colspan="2">Order Code</td></tr><tr><td colspan="2">6ZAB001</td></tr></table>		Order Code		6ZAB001				
Order Code										
6ZAB001										
E Handknob and Locknut		F Handknob and Locknut								
										
		<table><tr><td colspan="2">Order Code</td></tr><tr><td colspan="2">4DCM06K001</td></tr></table>		Order Code		4DCM06K001				
Order Code										
4DCM06K001										
K Handknob with Lock Knob		C Tamper Resistant Cover								
										
		<table><tr><td>Ø D</td><td>Order Code</td></tr><tr><td>Ø 19</td><td>6GH08C010</td></tr><tr><td>Ø 25</td><td>6GH08C011</td></tr><tr><td>Ø 30</td><td>6GH10C001</td></tr><tr><td>Ø 40</td><td>6GH12C001</td></tr></table>	Ø D	Order Code	Ø 19	6GH08C010	Ø 25	6GH08C011	Ø 30	6GH10C001
Ø D	Order Code									
Ø 19	6GH08C010									
Ø 25	6GH08C011									
Ø 30	6GH10C001									
Ø 40	6GH12C001									

SOLENOID OPERATED VALVES

(Accessories)

Cover For Safety Push Style "M" & "P"		Cover For Safety Push And Twist Style "T"	
To operate manual override,screw out the knob protection after removing wire-locking and push and hold override button. To return to normal valve operation, simply release the button.		To operate manual override,screw out the knob protection after removing wire-locking and turn clockwise and release override button. To return to normal valve operation,push override button,turn counterclockwise and release.	
Order Code 6JAA004		Order Code 6JAA005	
			
Plastic Nut For Style "M", "P" & "T"		Plastic Nut For Style "Non-adjustable"	
Order Code 6JAA006		Order Code 6JAA007	
			

HOW TO ORDER "SEAL KITS"

"Winner Hydraulics" supply a quick and easy way to order "SEAL KITS" of "Hydraulic Cartridge Valves".
Even the valves use the same cavity, they could use different seals and backup-rings positions.

EXAMPLES:

VALVE CODE: RP10A20AL

SEAL KIT CODE: ZRP10A20AL

(Please put a alphabet "Z" in front of valve code
This way is suit for most of Winner products, including "Manifolds")

Explanation:

- (1) AS the customer is not allowed to disassemble cartridge valves, "SEAL KITS" only include all external seals, internal seals of cartridge valves are not included.
- (2) BACKUP RINGS: LUBRIFLON-PTFE and other compounds.
- (3) The standard material of O-ring is Acryl-Nitrile Butadiene Rubber NBR (BUNA-N), temperature between -30°C and 100°C
- (4) The positions of O-ring and back-up rings could be different, event thought they use same cavity.
Please check: the O-ring should be towards the higher pressure port if one back-up ring is present or between double back-up rings if both ports receive high pressure.
- (5) If you need any drawing for installation, please consult us.

ACCESSORIES

SOCKET HEAD CAP SCREW

(For Sandwich Bodies)

Ordering Code:

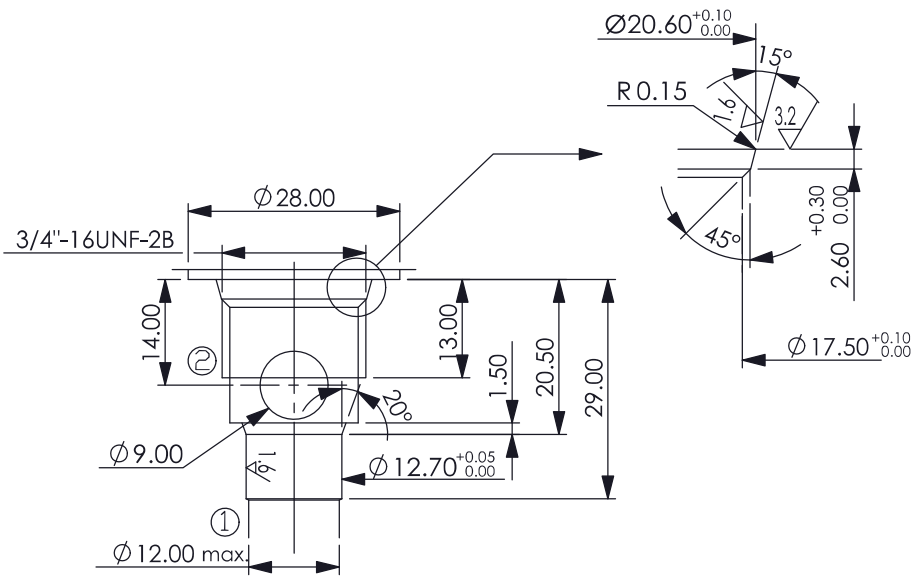
SHCS-X-Y-Z-01

UNIT:mm

X	M	METRIC	
Y	05	M5*P0.8	
	06	M6*P1.0	
Z	85	L=85mm	
	90	L=90mm	
	125	L=125mm	
	135	L=135mm	
	165	L=165mm	
	180	L=180mm	

CAVITIES-TOOLING

Cavity-Tooling:08W-2

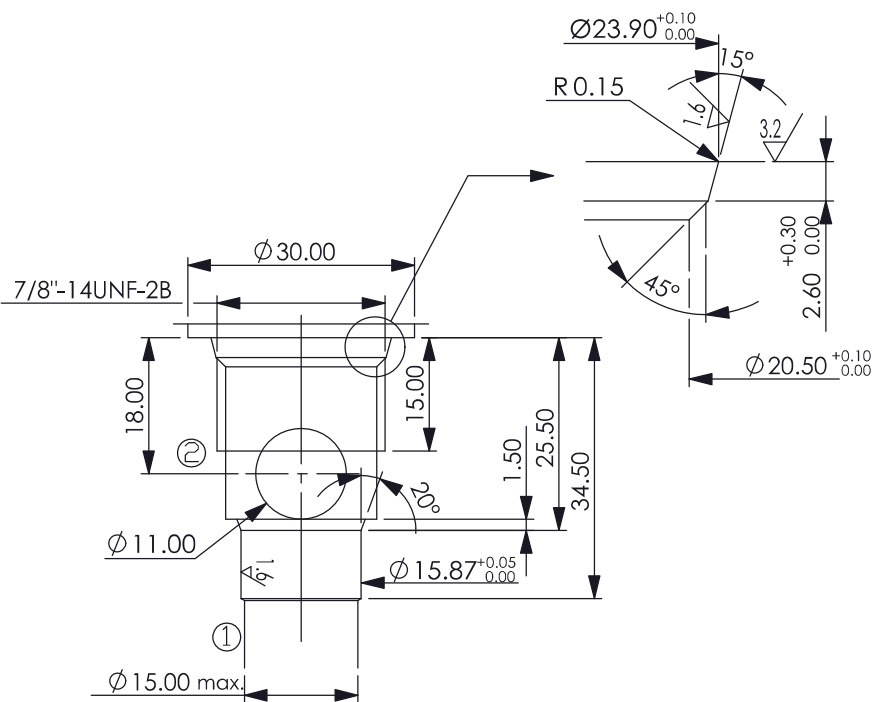


0.03

0.02

UNIT:mm

Cavity-Tooling:10W-2



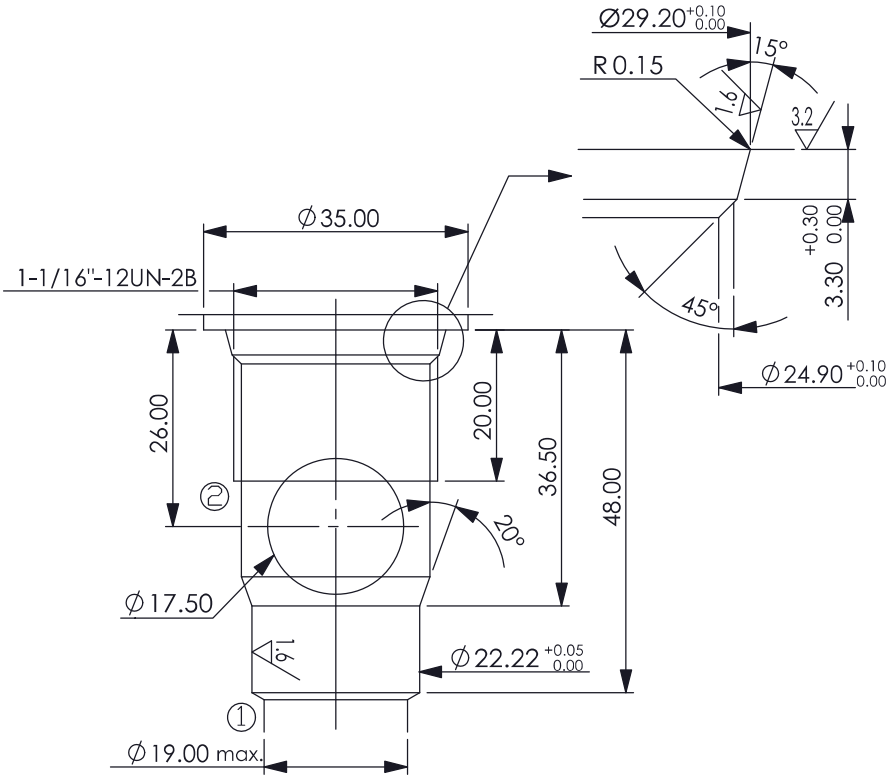
0.03

0.02

UNIT:mm

CAVITIES-TOOLING

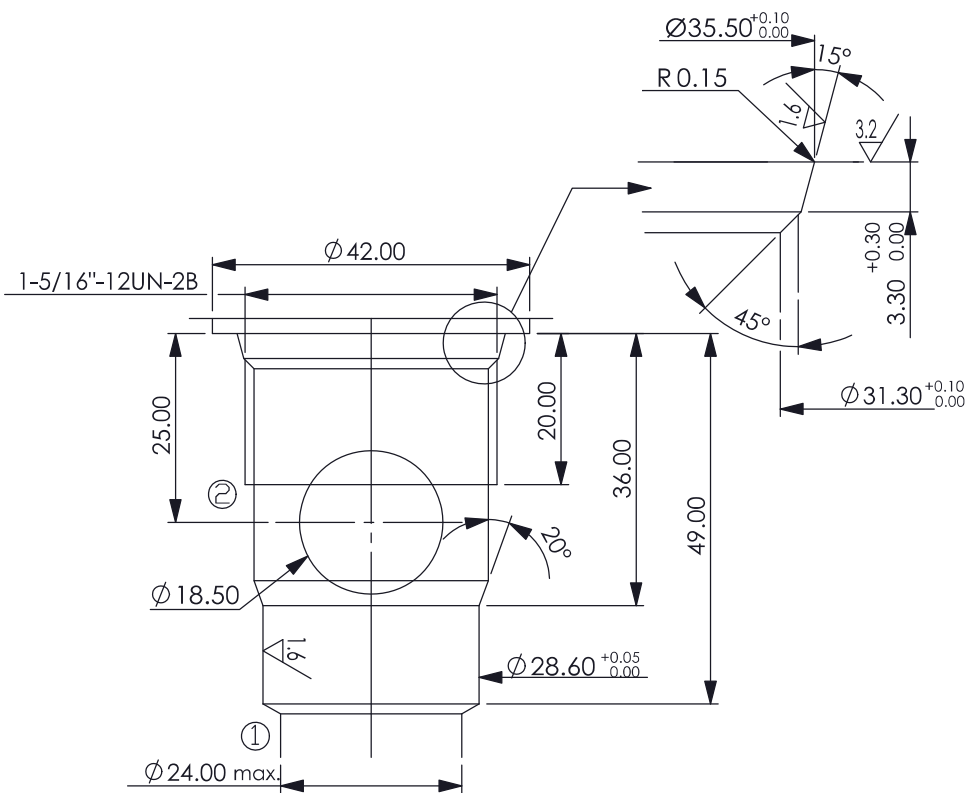
Cavity-Tooling:12W-2



	0.03
	0.02

UNIT:mm

Cavity-Tooling:16W-2

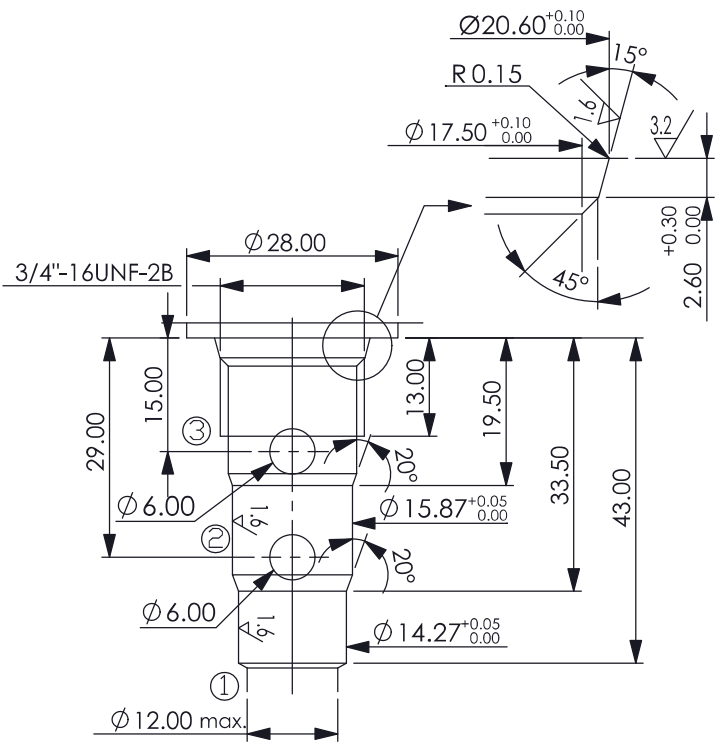


	0.03
	0.02

UNIT:mm

CAVITIES-TOOLING

Cavity-Tooling:08W-3

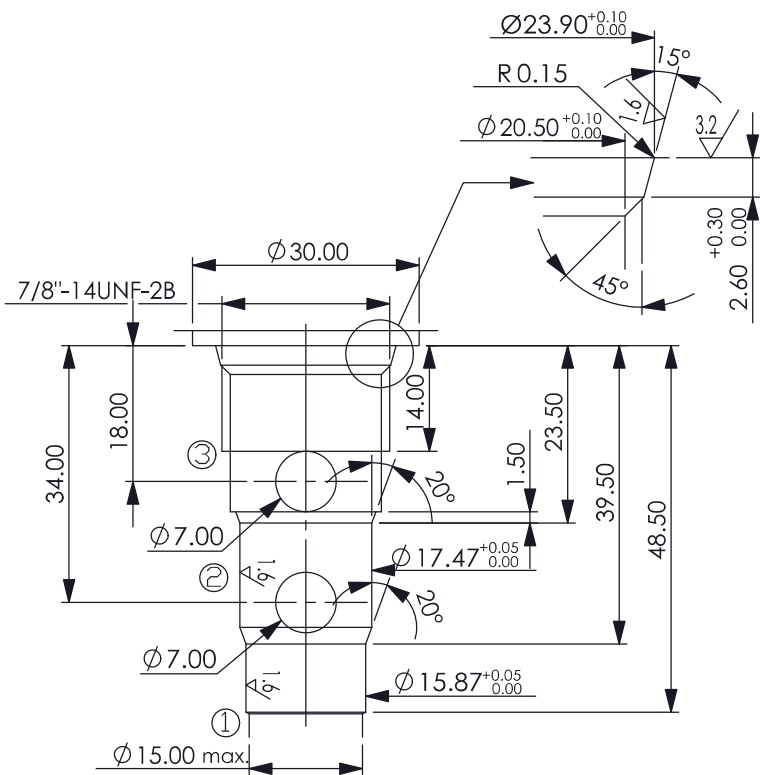


0.03

0.02

UNIT:mm

Cavity-Tooling:10W-3



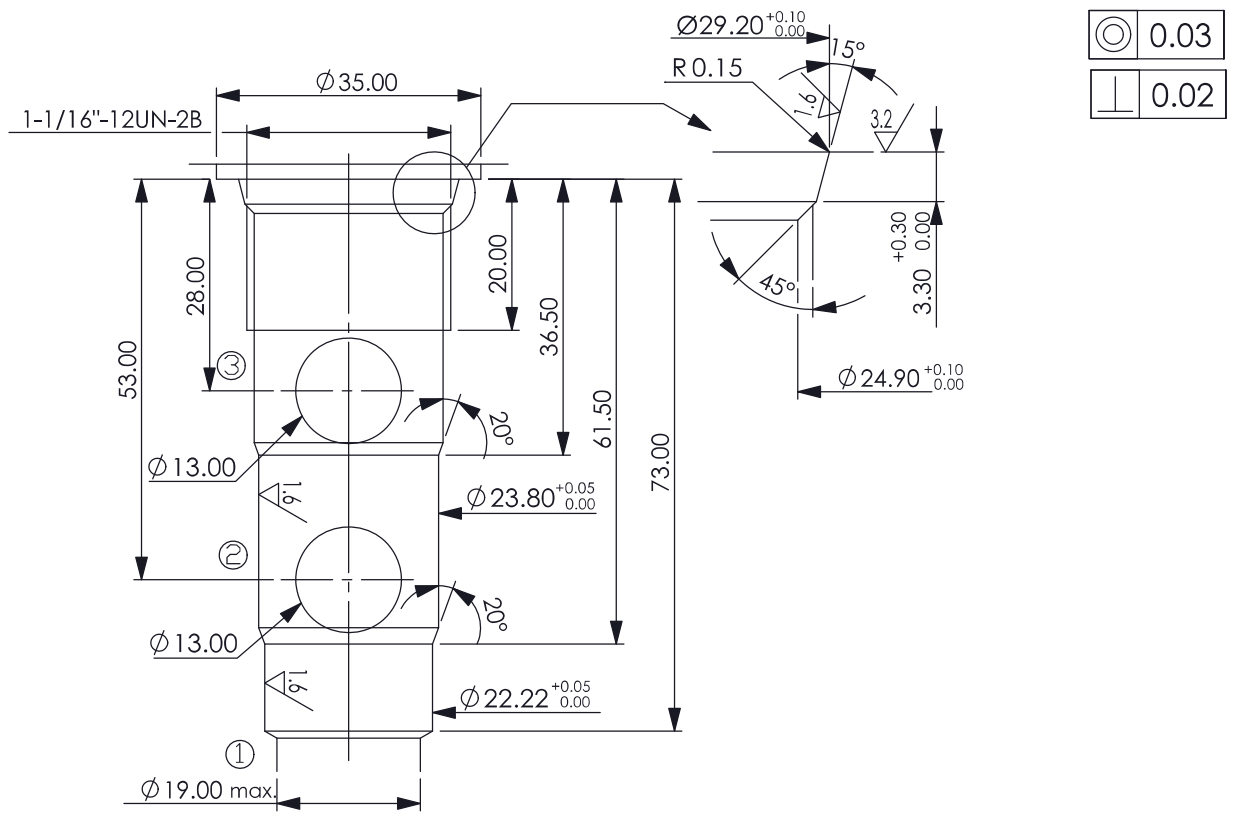
0.03

0.02

UNIT:mm

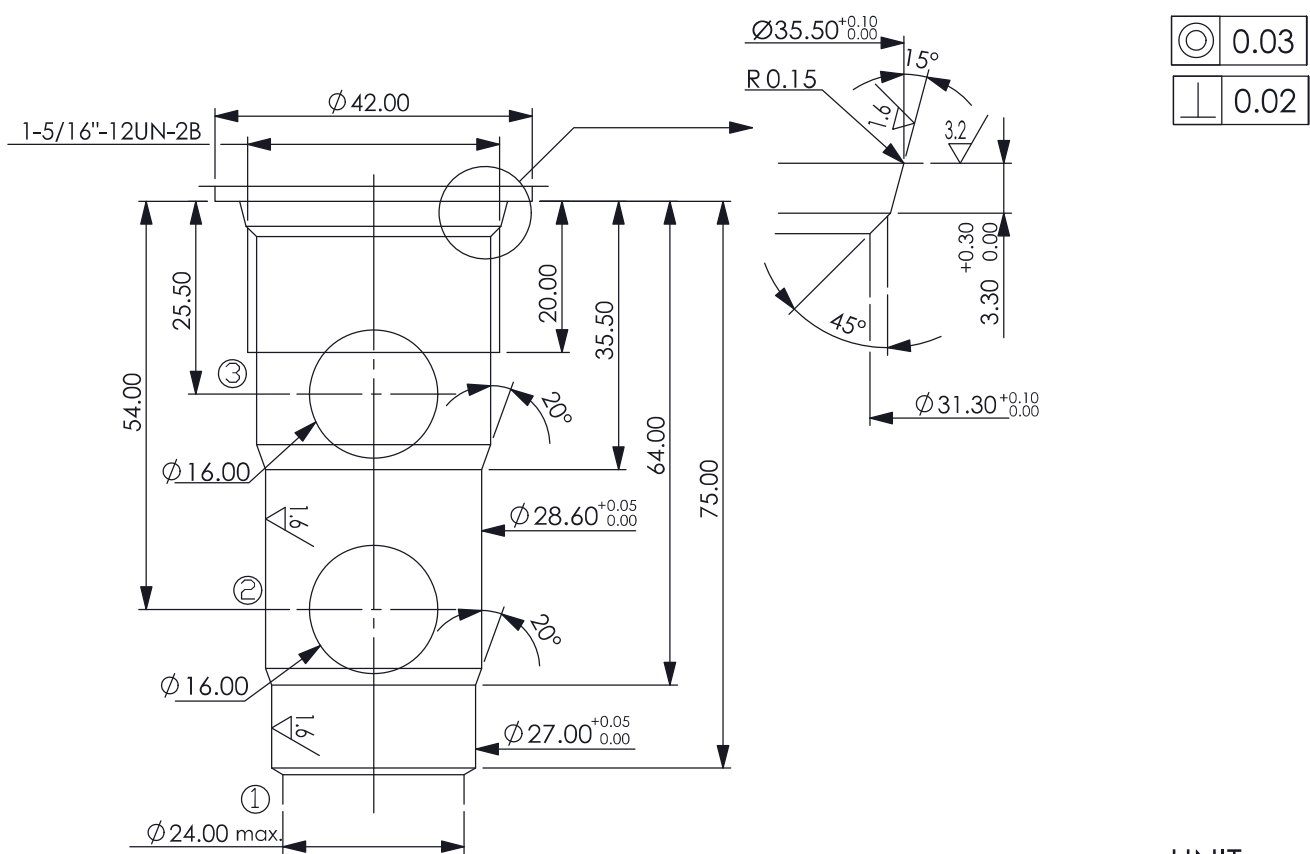
CAVITIES-TOOLING

Cavity-Tooling:12W-3



UNIT:mm

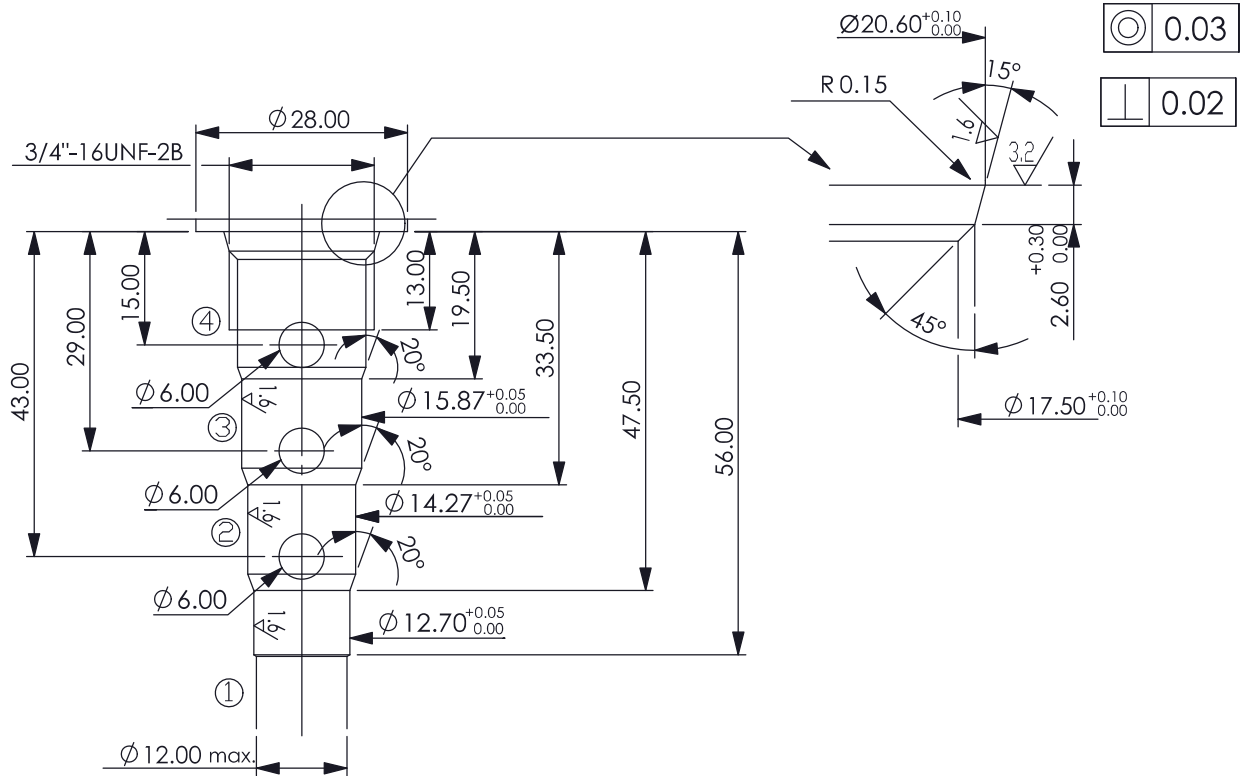
Cavity-Tooling:16W-3



UNIT:mm

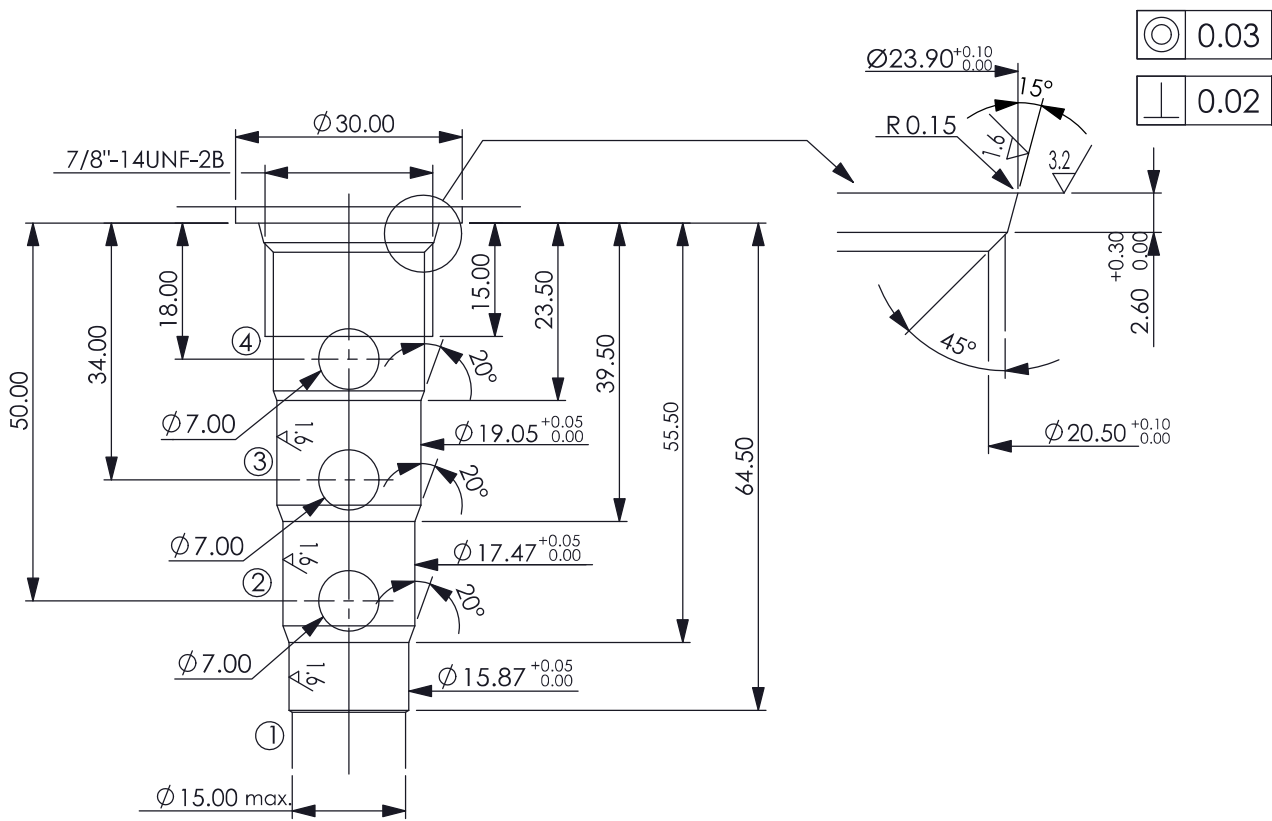
CAVITIES-TOOLING

Cavity-Tooling:08W-4



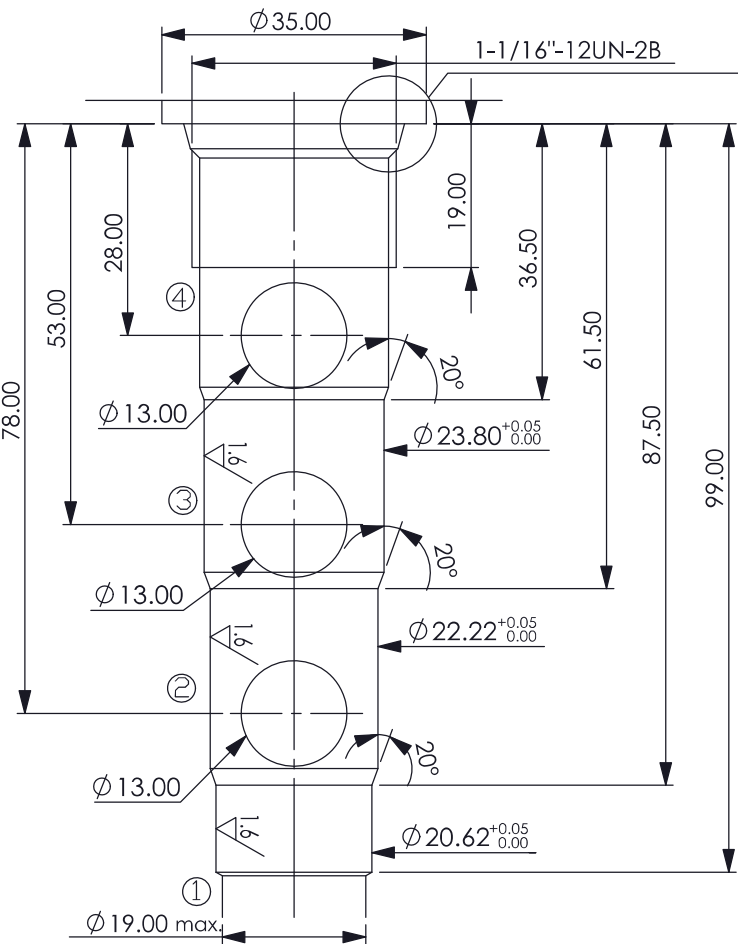
UNIT:mm

Cavity-Tooling:10W-4



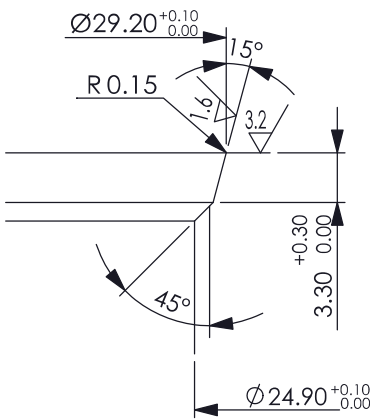
UNIT:mm

CAVITIES-TOOLING

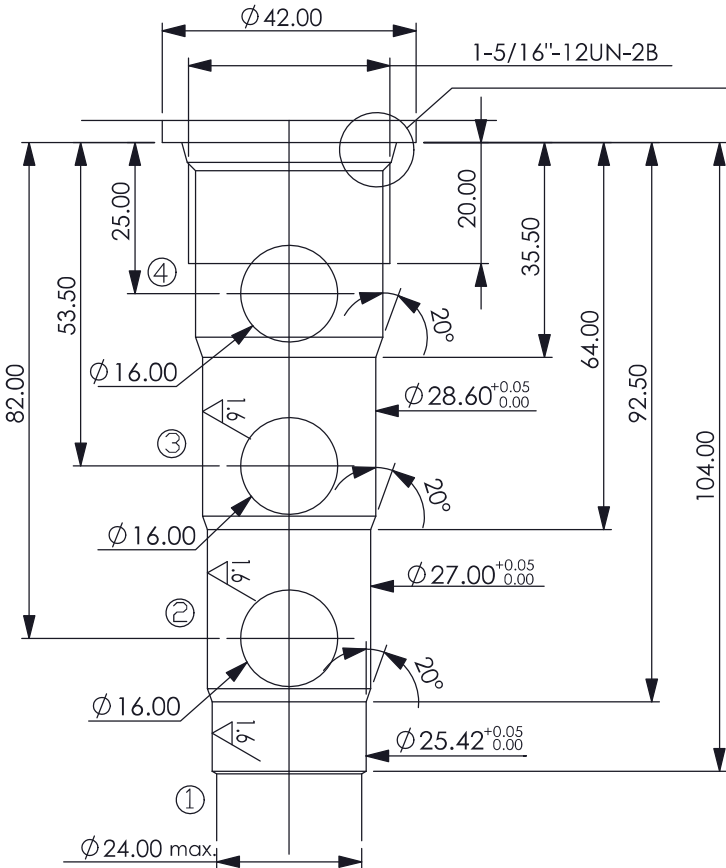


Cavity-Tooling:12W-4

	0.03
	0.02

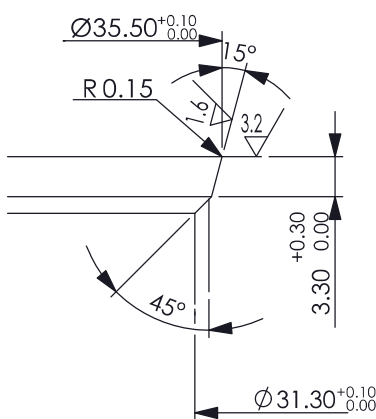


UNIT:mm



Cavity-Tooling:16W-4

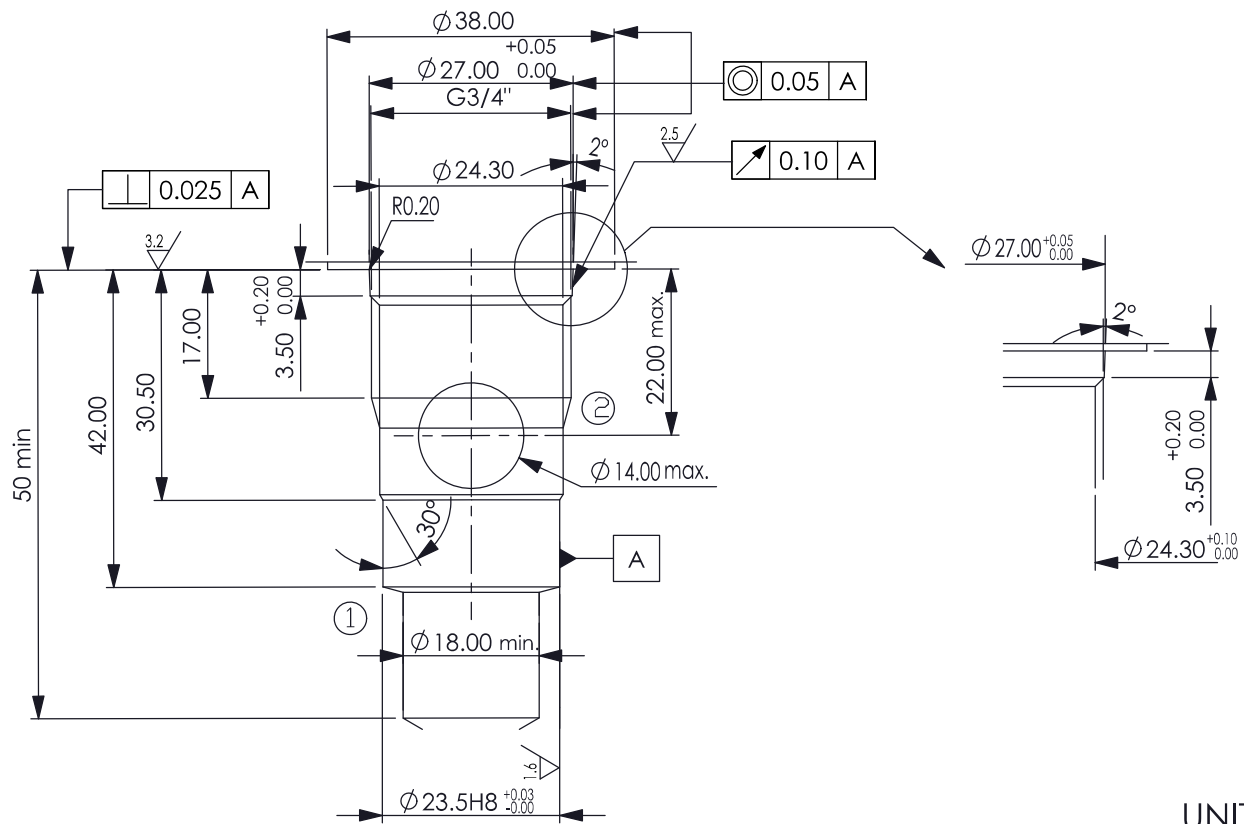
	0.03
	0.02



UNIT:mm

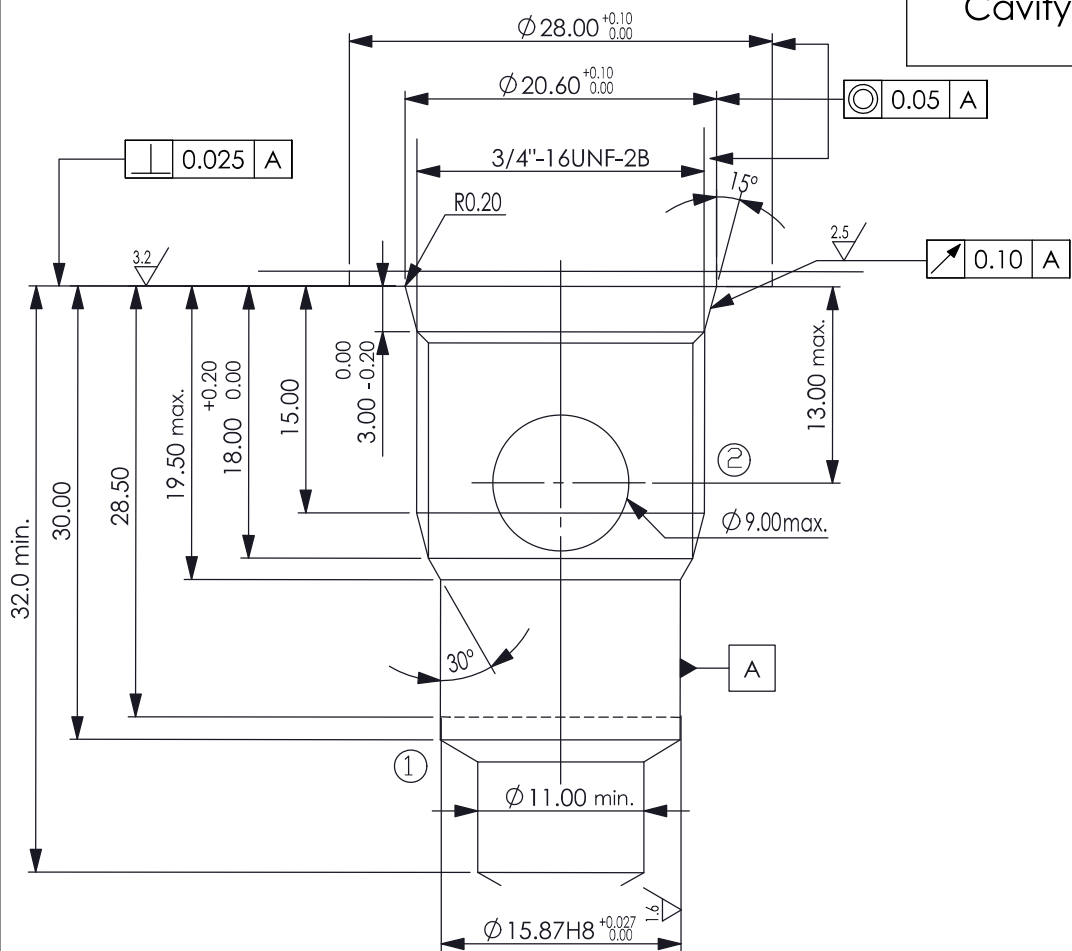
CAVITIES-TOOLING

Cavity-Tooling:17E-2



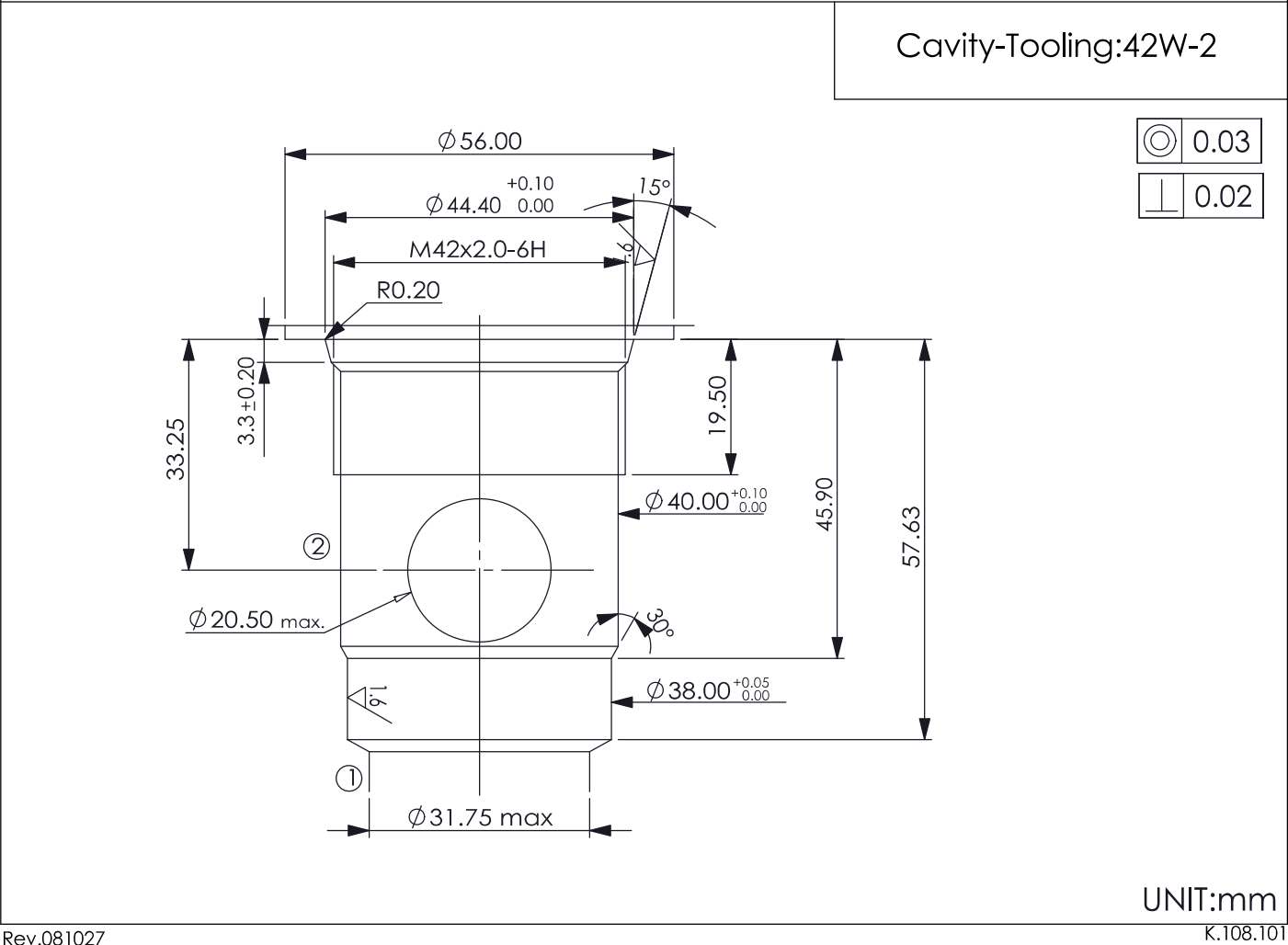
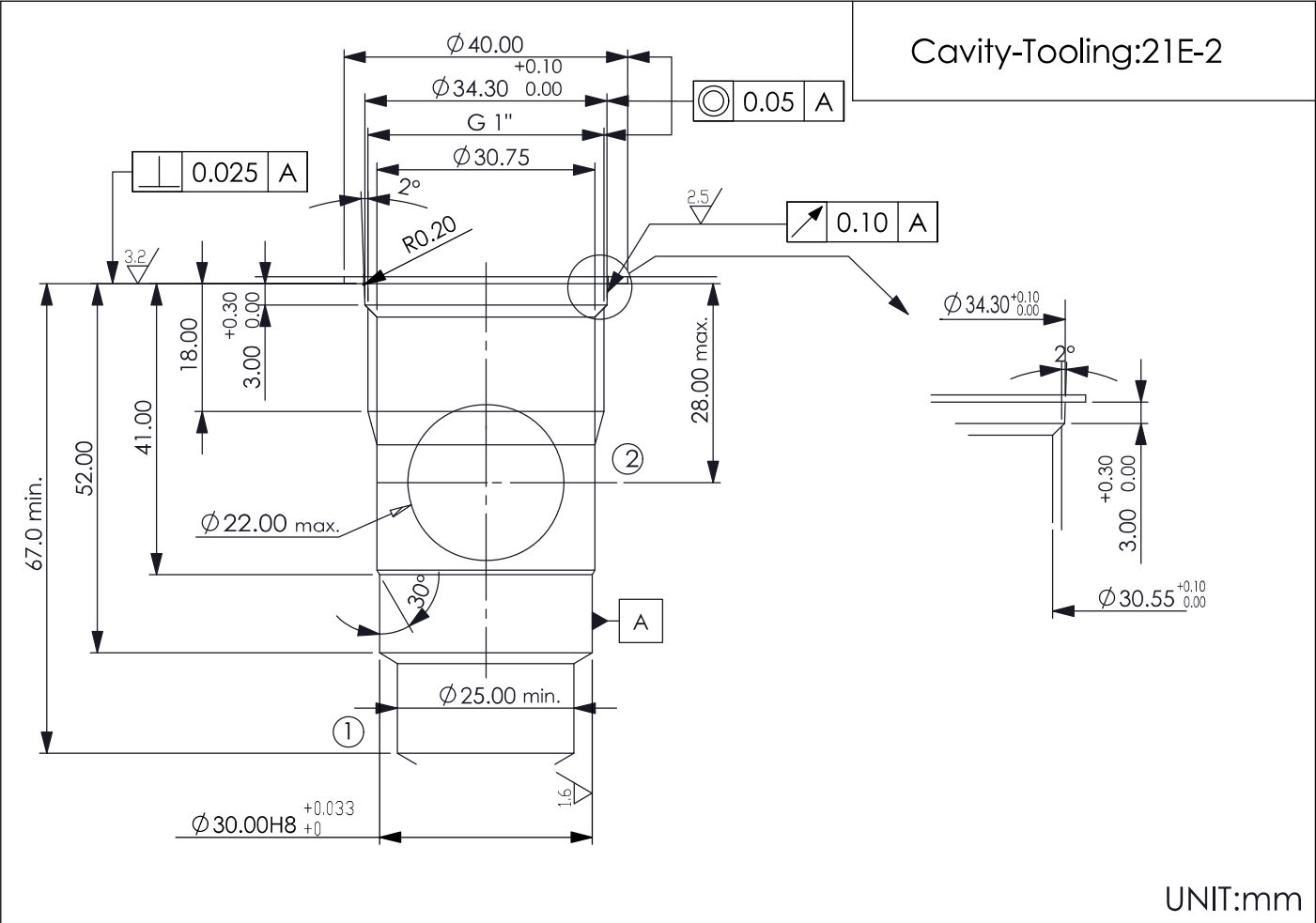
UNIT:mm

Cavity-Tooling:19E-2



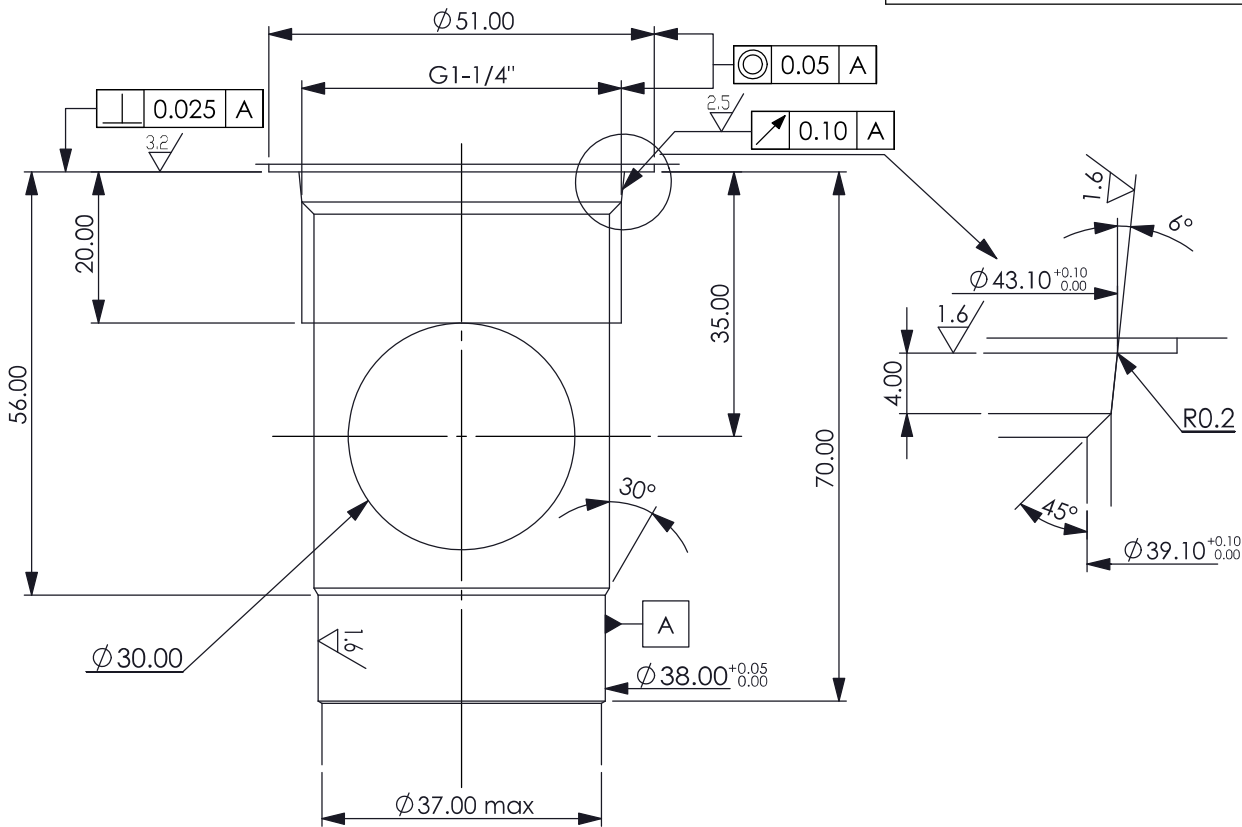
UNIT:mm

CAVITIES-TOOLING



CAVITIES-TOOLING

Cavity-Tooling:04E-2



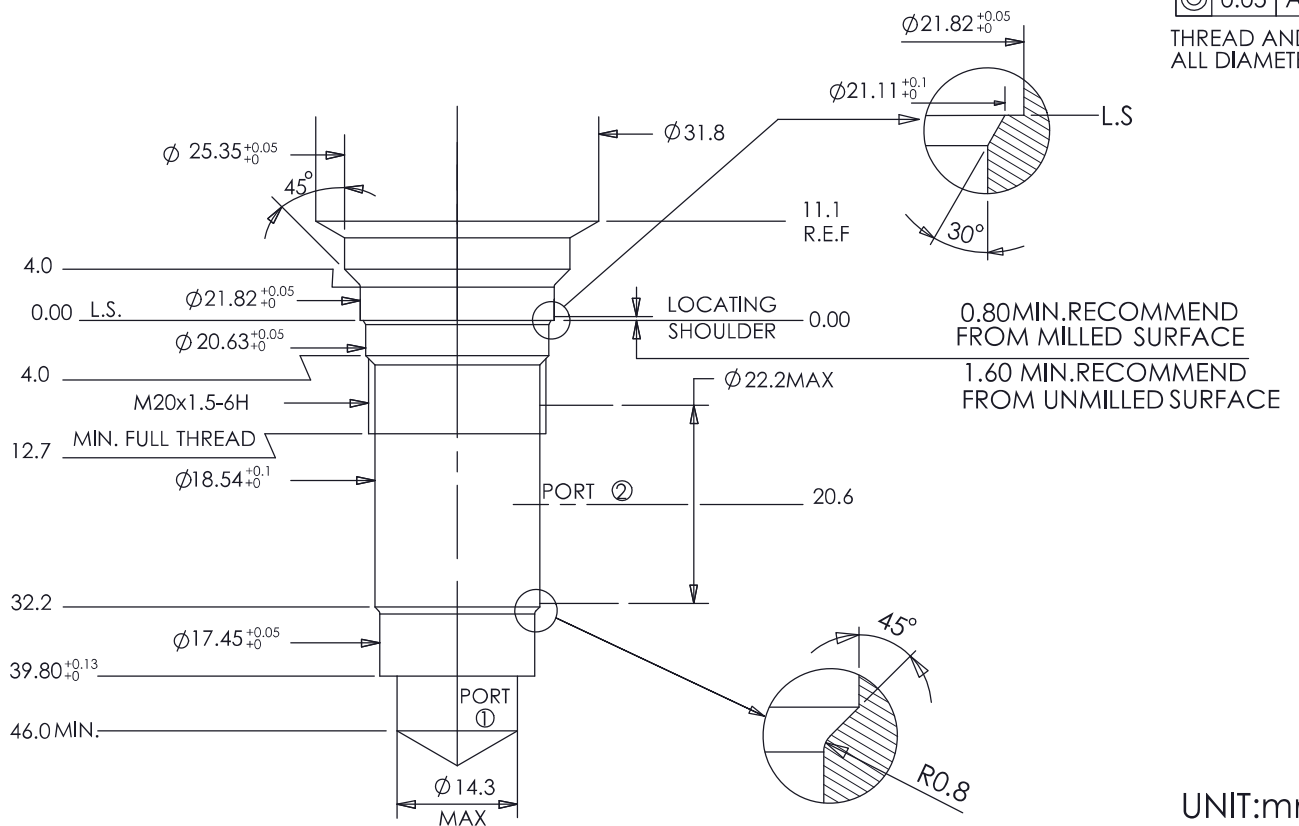
UNIT:mm

CAVITIES-TOOLING

Cavity-Tooling:10A-2

© 0.05 A

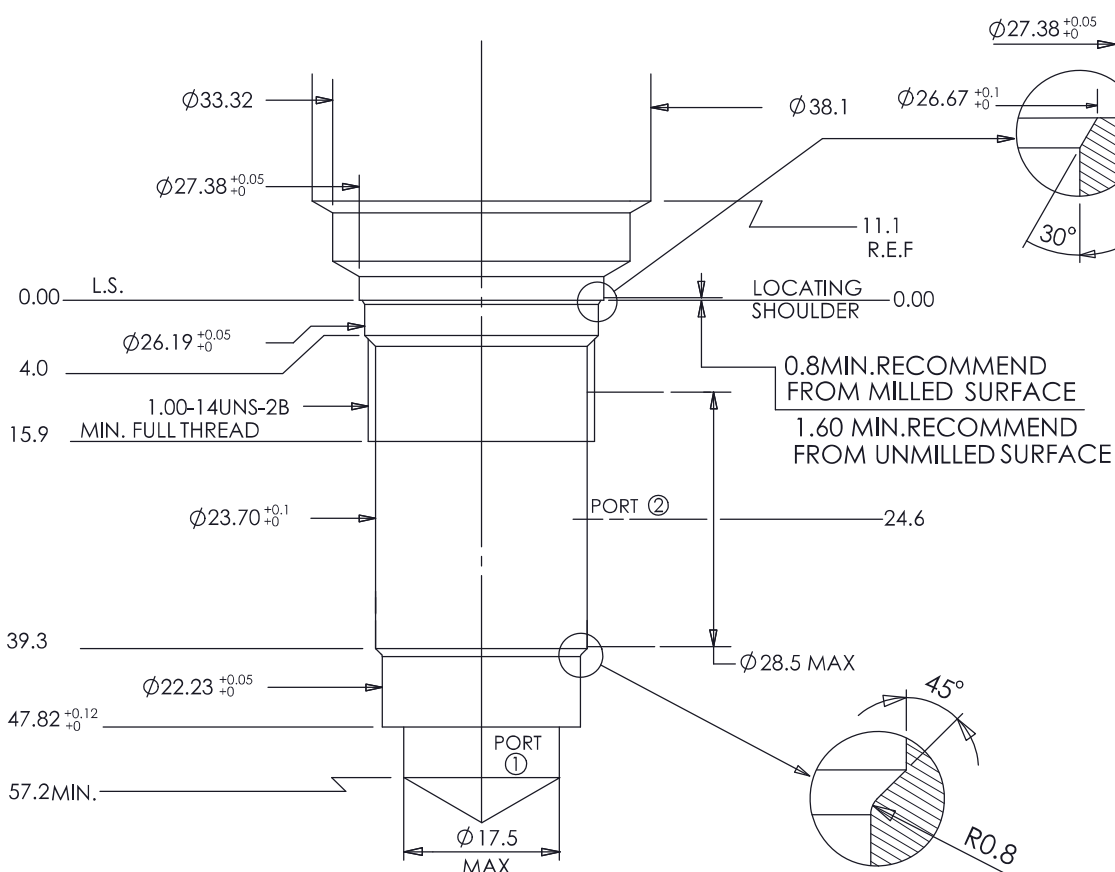
THREAD AND ALL DIAMETERS



UNIT:mm

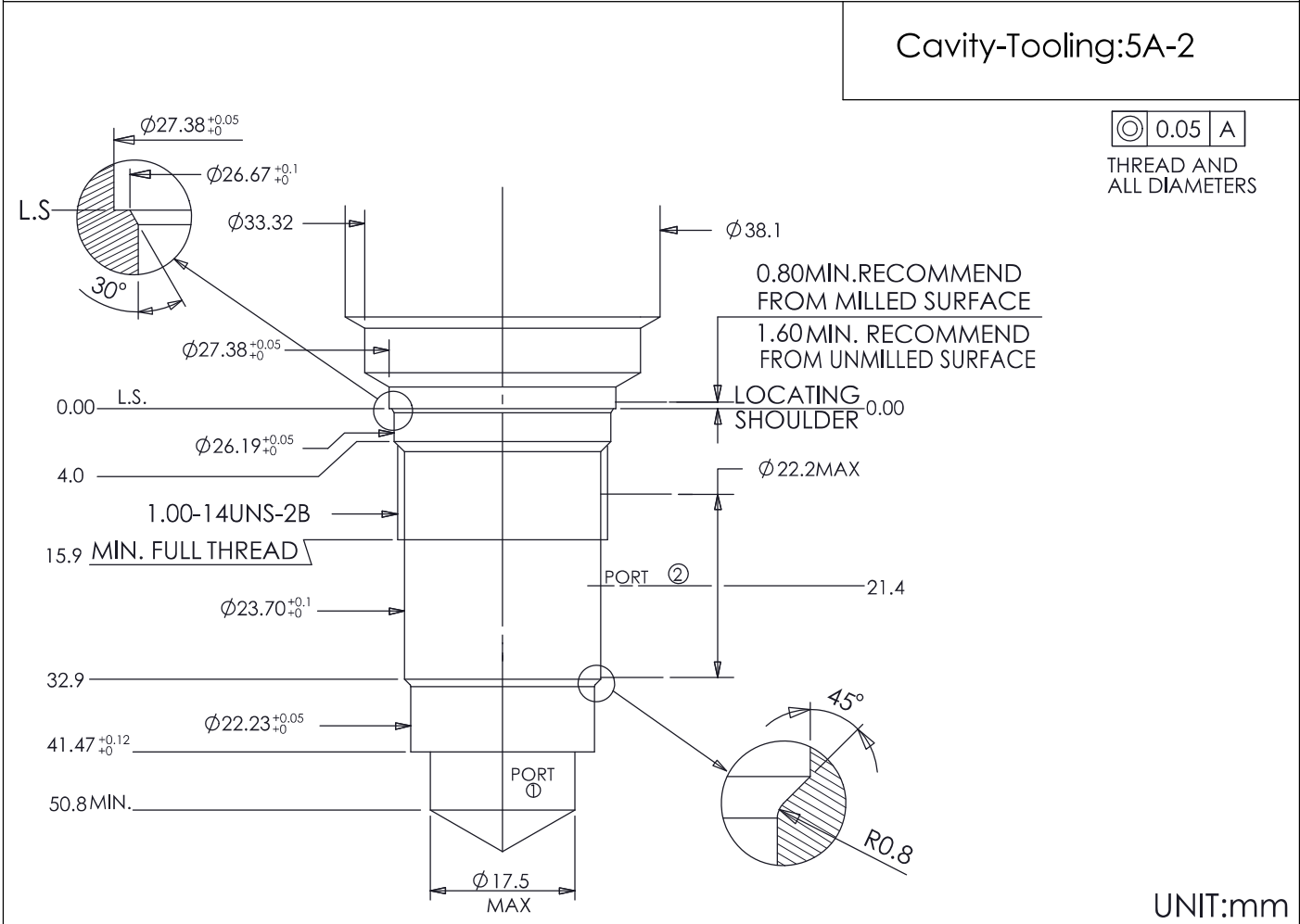
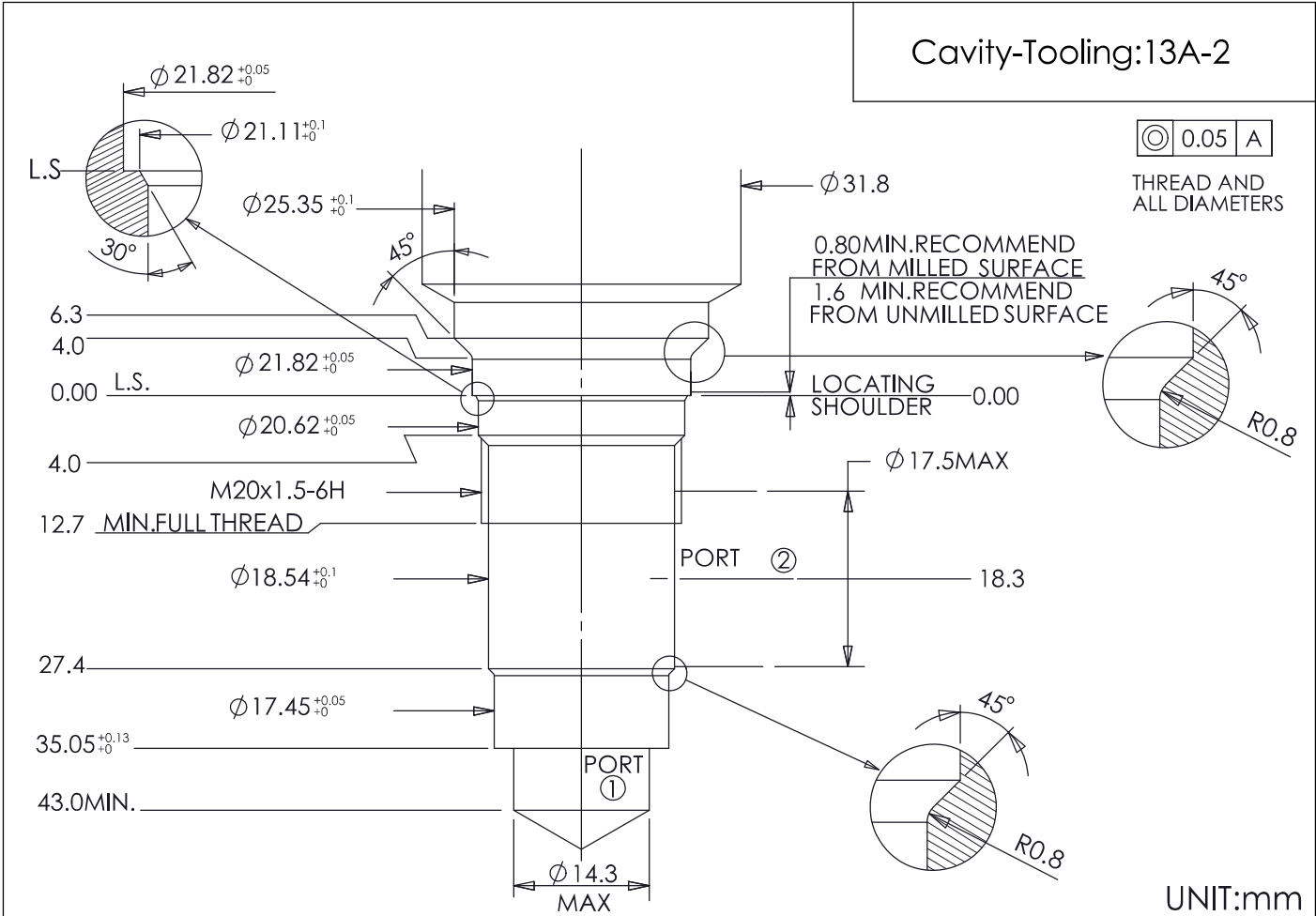
Cavity-Tooling:3A-2

© 0.05 A
THREAD AND
ALL DIAMETERS



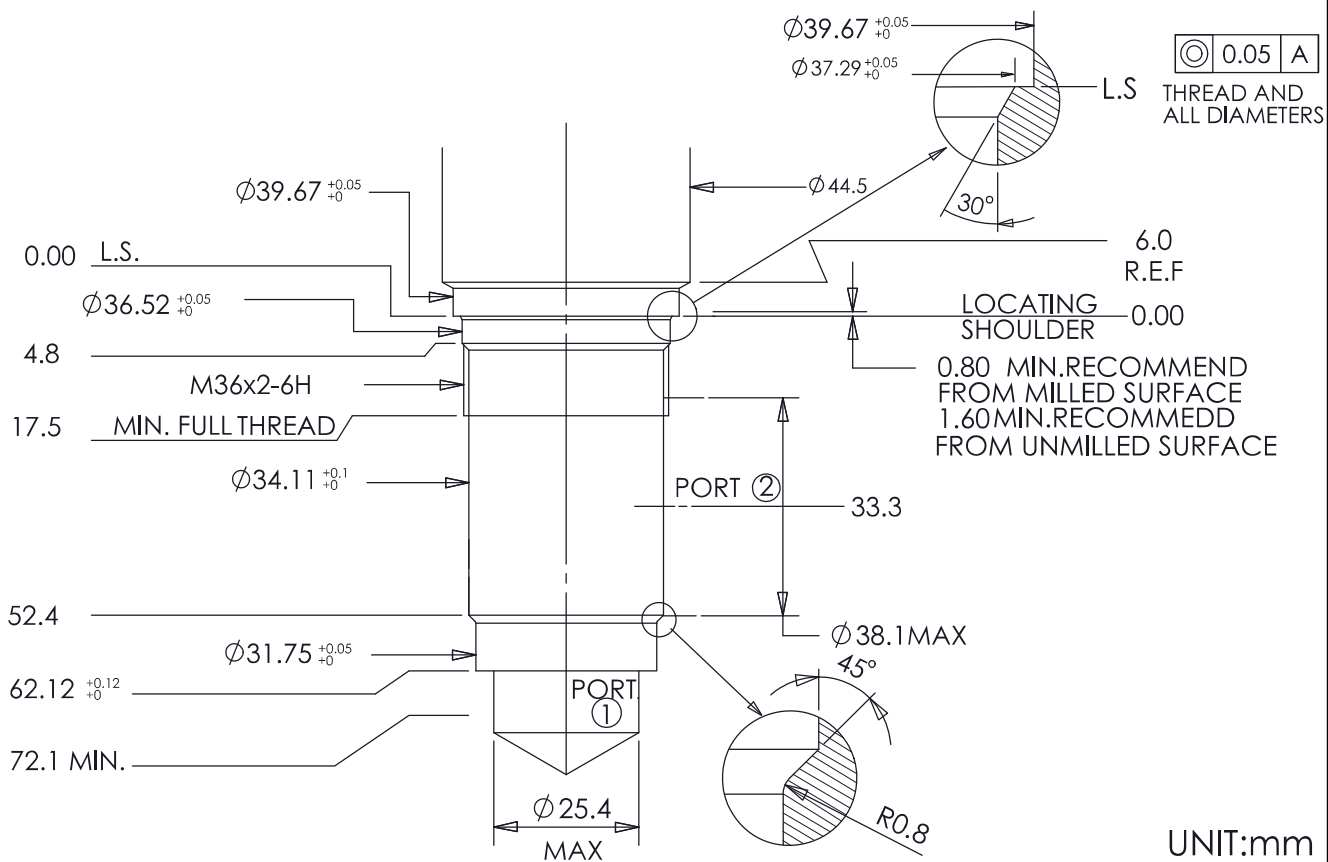
UNIT:mm

CAVITIES-TOOLING

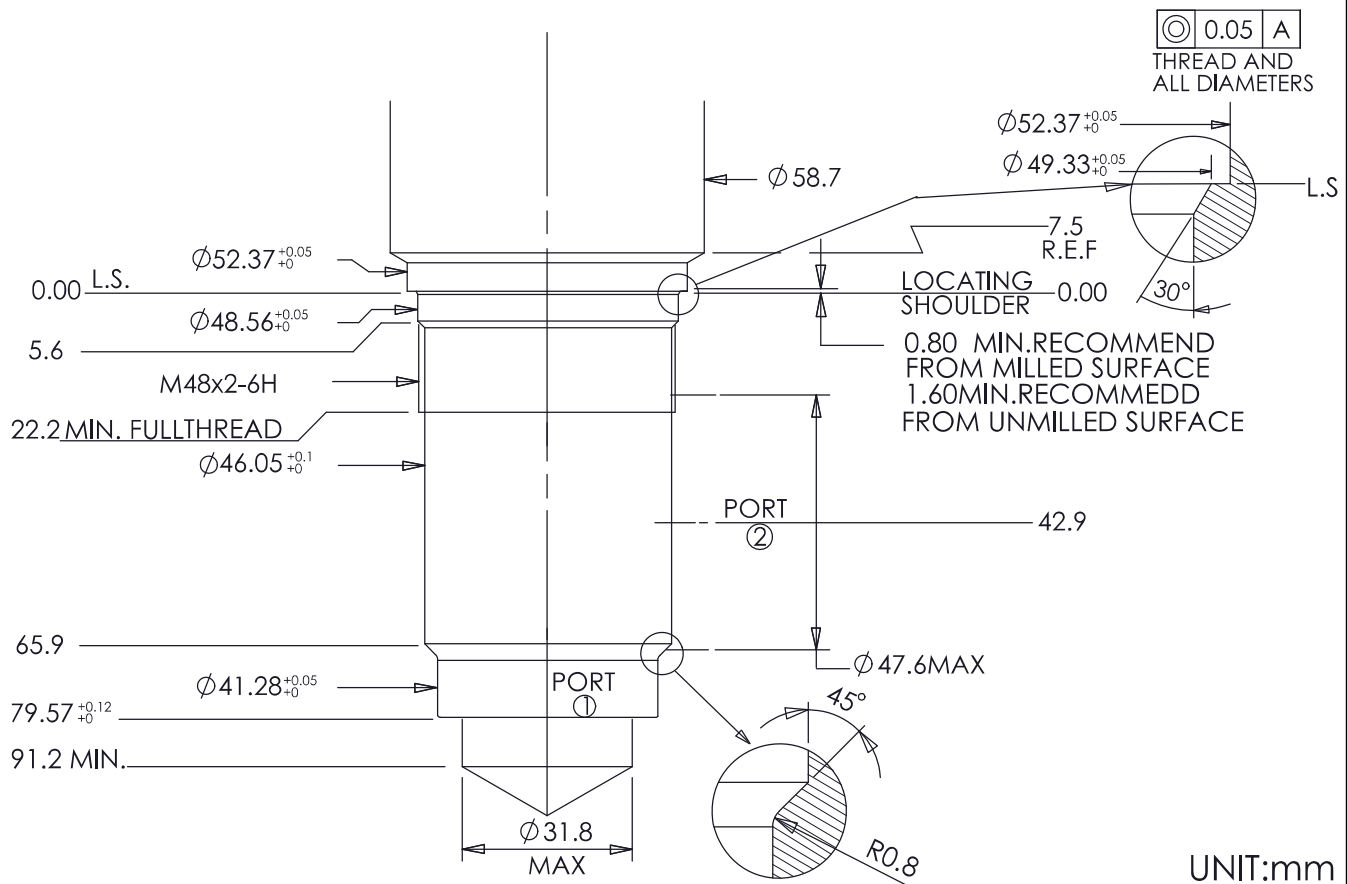


CAVITIES-TOOLING

Cavity-Tooling:16A-2

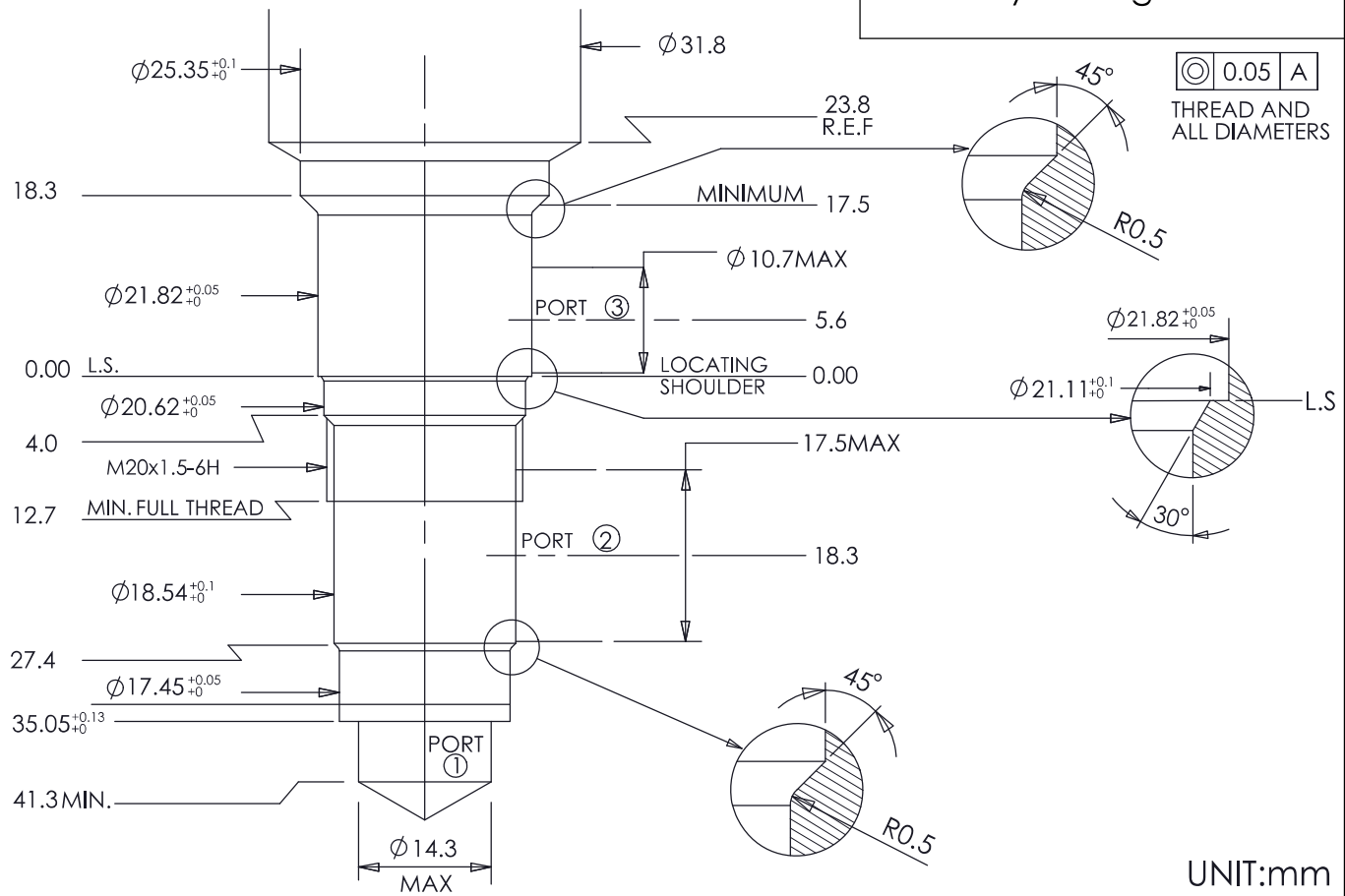


Cavity-Tooling:18A-2

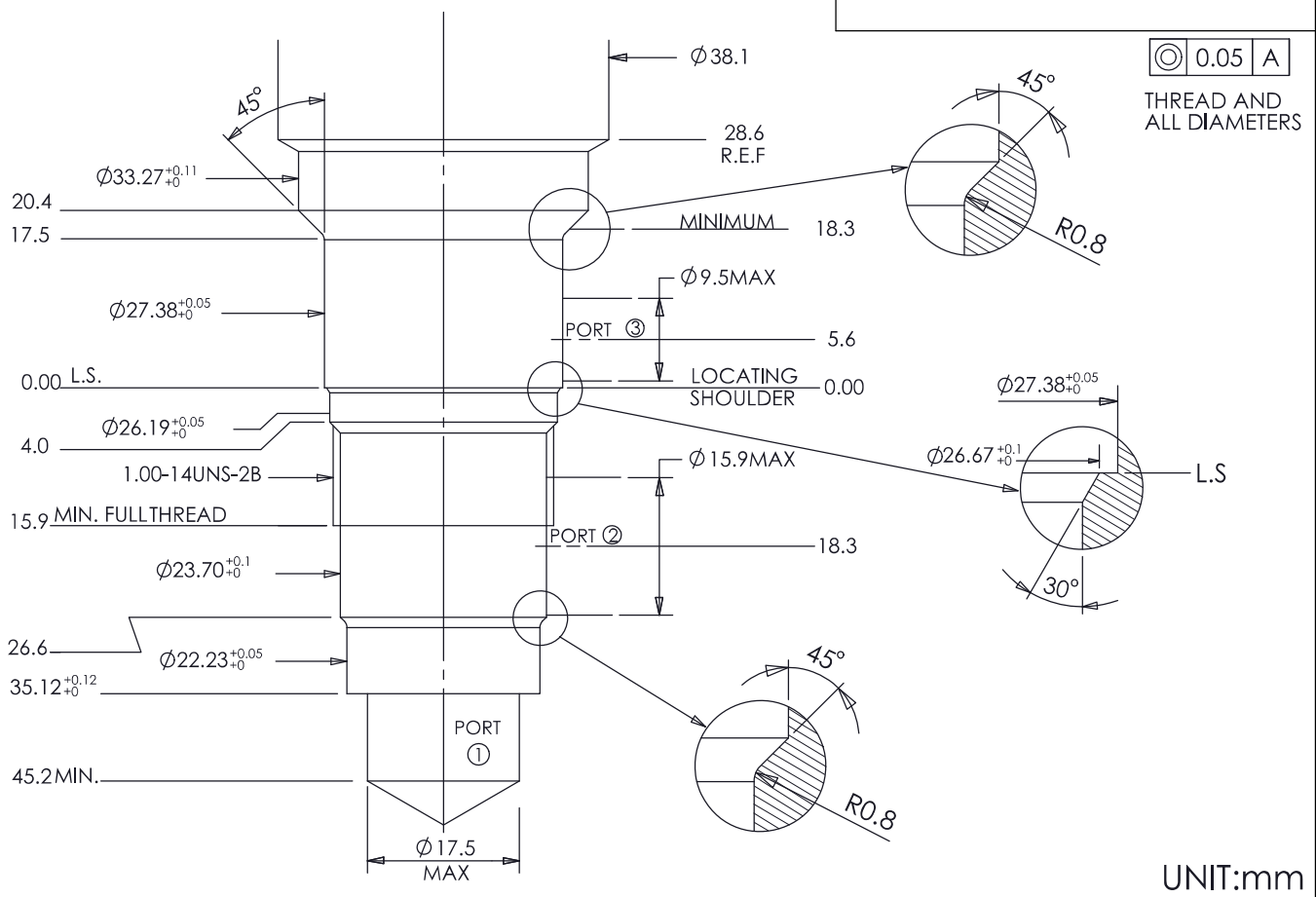


CAVITIES-TOOLING

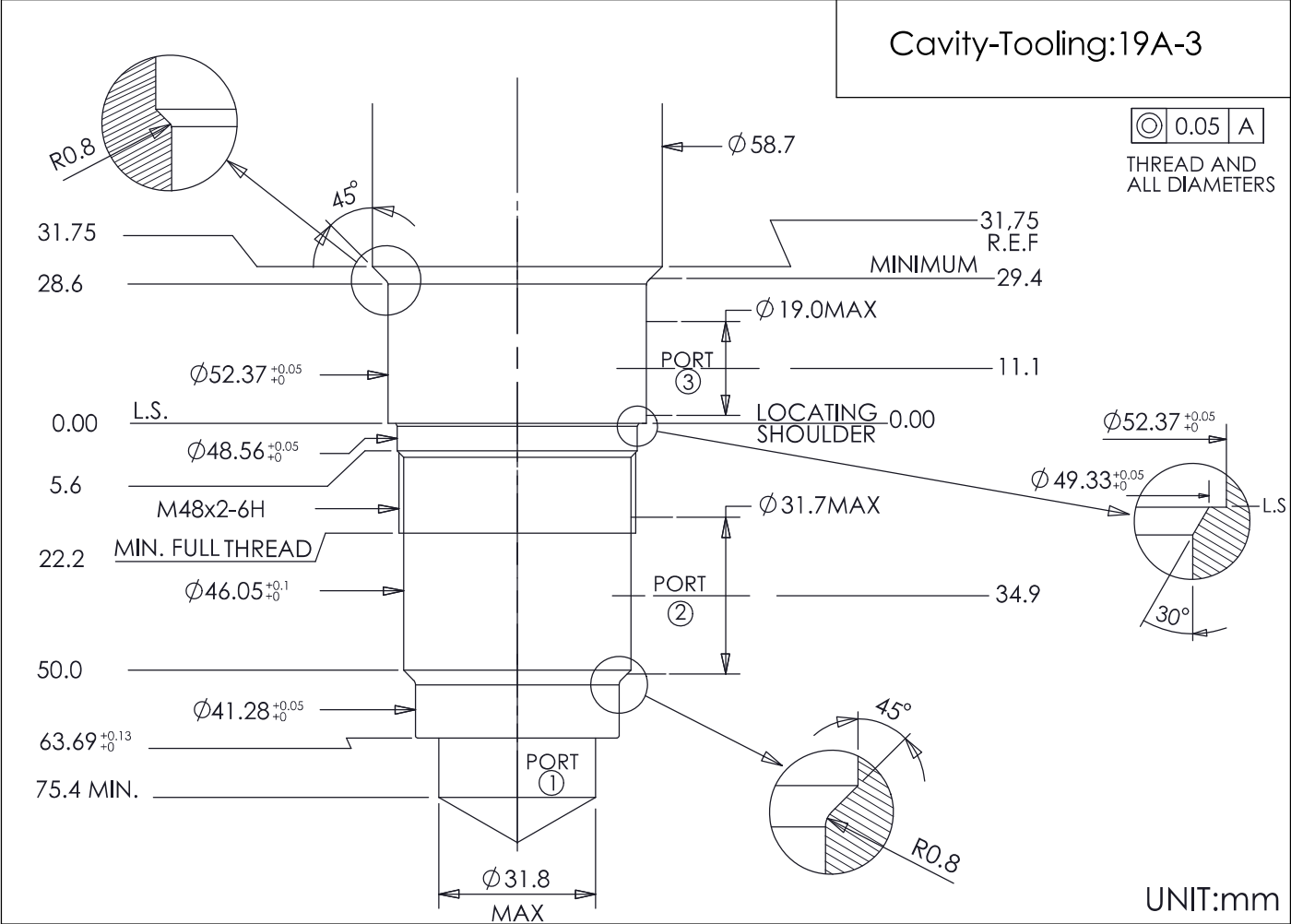
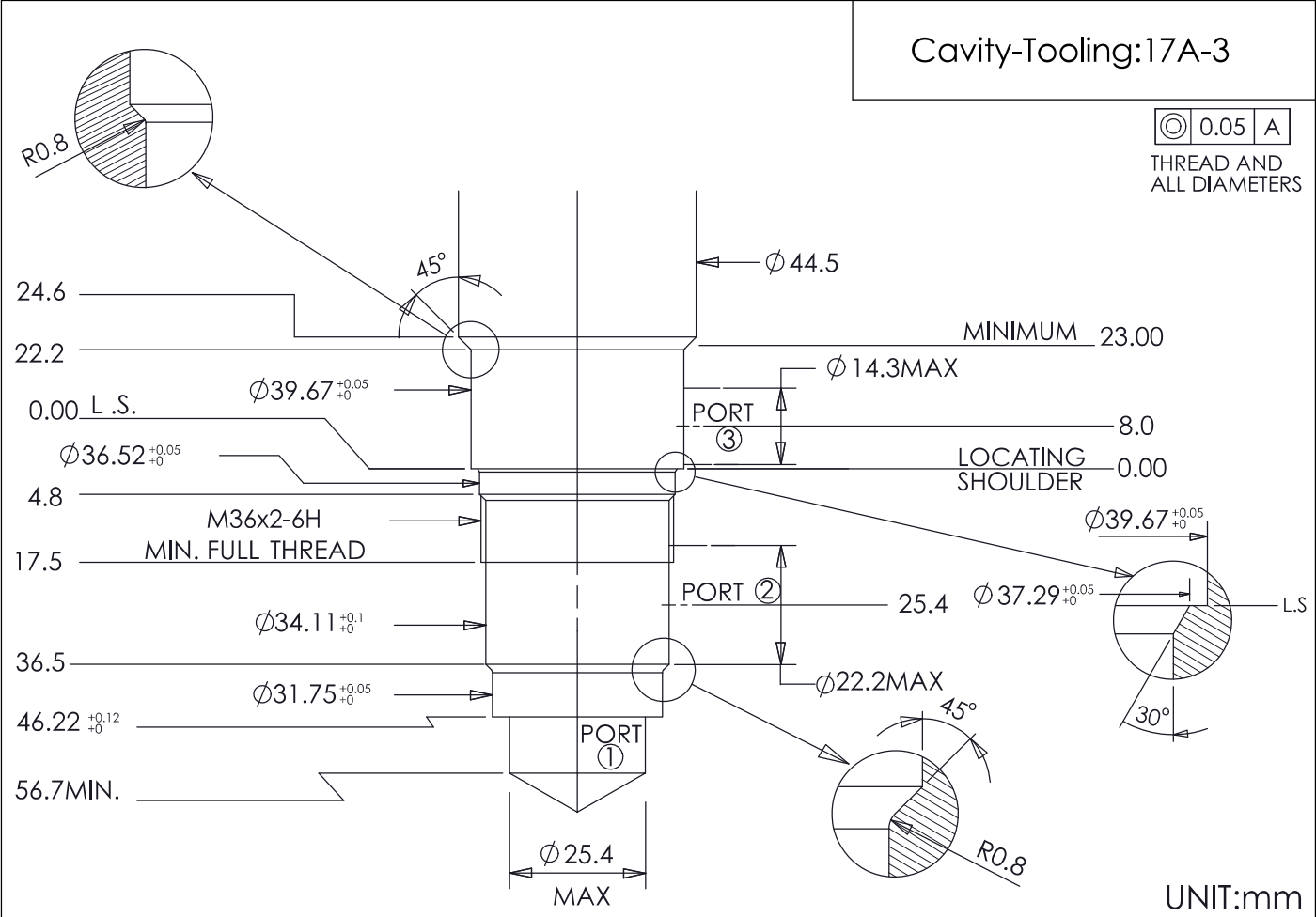
Cavity-Tooling:11A-3



Cavity-Tooling:2A-3



CAVITIES-TOOLING



Cavity-Tooling:22A-4

Technical drawing of a mechanical part, likely a bush or sleeve, showing a side view and two cross-sectional views. The side view shows a stepped shaft with various diameters and lengths. Key features include a 45-degree chamfer at the top, a minimum full thread section, and four ports labeled 1, 2, 3, and 4. Two cross-sectional views are provided: one showing a 30-degree chamfer and the other showing a 45-degree chamfer and a fillet radius R0.8. Dimensions are given in millimeters with tolerances.

Dimensions and Tolerances:

- Top diameter: $\phi 38.10$
- Top length: 43.70 R.E.F.
- Chamfer: 45°
- Shoulder diameter: $\phi 33.27^{+0.05}_0$
- Shoulder length: 32.5
- Radius: R0.8
- Inner diameter: $\phi 28.14^{+0.05}_0$
- Length: 17.5
- Radius: R0.8
- Inner diameter: $\phi 27.38^{+0.05}_0$
- Length: 17.5
- Inner diameter: $\phi 26.19^{+0.05}_0$
- Length: 4.0
- Section: MIN. FULL THREAD
- Length: 15.9
- Inner diameter: $\phi 23.70^{+0.1}_0$
- Length: 26.6
- Inner diameter: $\phi 22.23^{+0.05}_0$
- Length: 35.12 $^{+0.12}_0$
- Bottom diameter: $\phi 17.5$ MAX

Ports and Features:

- PORT ①: Bottom port, length 45.2 MIN.
- PORT ②: Length 18.3
- PORT ③: LOCATING SHOULDER, length 5.6
- PORT ④: Length 22.23

Cross-sectional Views:

- Top cross-section: Shows a 30° chamfer and a diameter of $\phi 27.38^{+0.05}_0$.
- Bottom cross-section: Shows a 45° chamfer and a fillet radius R0.8.

UNIT:mm