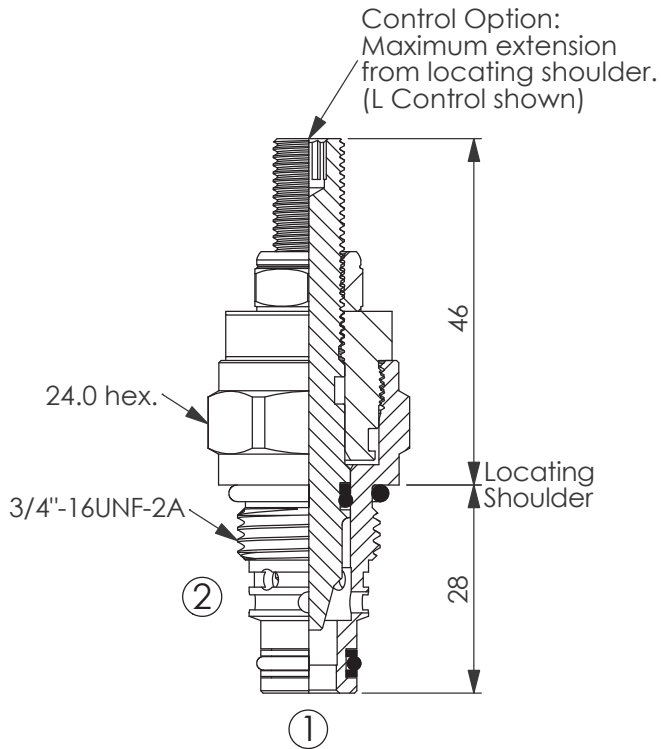




ZAWORY REGULUJĄCE PRZEPŁYW DŁAWIĄCE

FLOW CONTROL VALVE (Fully Adjustable Needle)

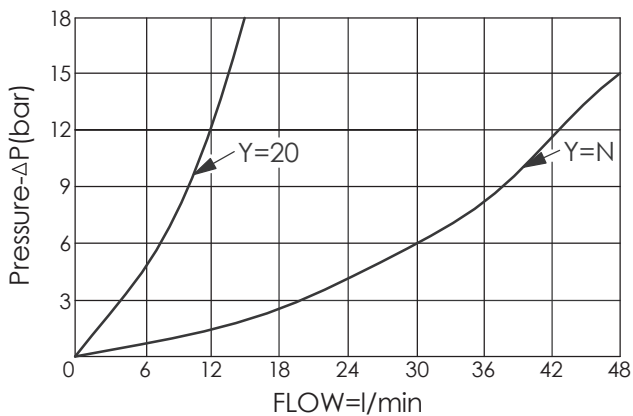
Ordering Code: **NV-08W-X-Y-Z**



UNIT:mm

Performance Chart

FULLY OPEN RESTRICTOR-FLOW IN BOTH DIRECTIONS



Y	MAXIMUM NOMINAL ORIFICE	
N	∅ 5.6 mm	
20	∅ 2.0 mm	



TECHNICAL DATA

Max. operating pressure:	350 bar
(Refer To Performance Chart)	
Rated Flow:	36 l/min
(Refer To Performance Chart)	
Cavity-Tooling:	08W-2
Installation torque:	25-35 Nm
Weight:	0.13 (Z:L) kg

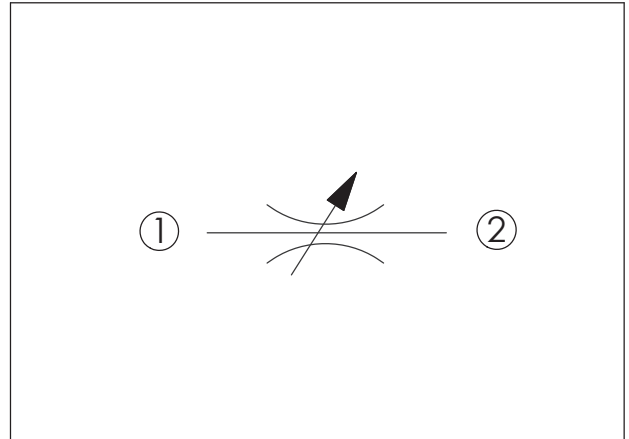
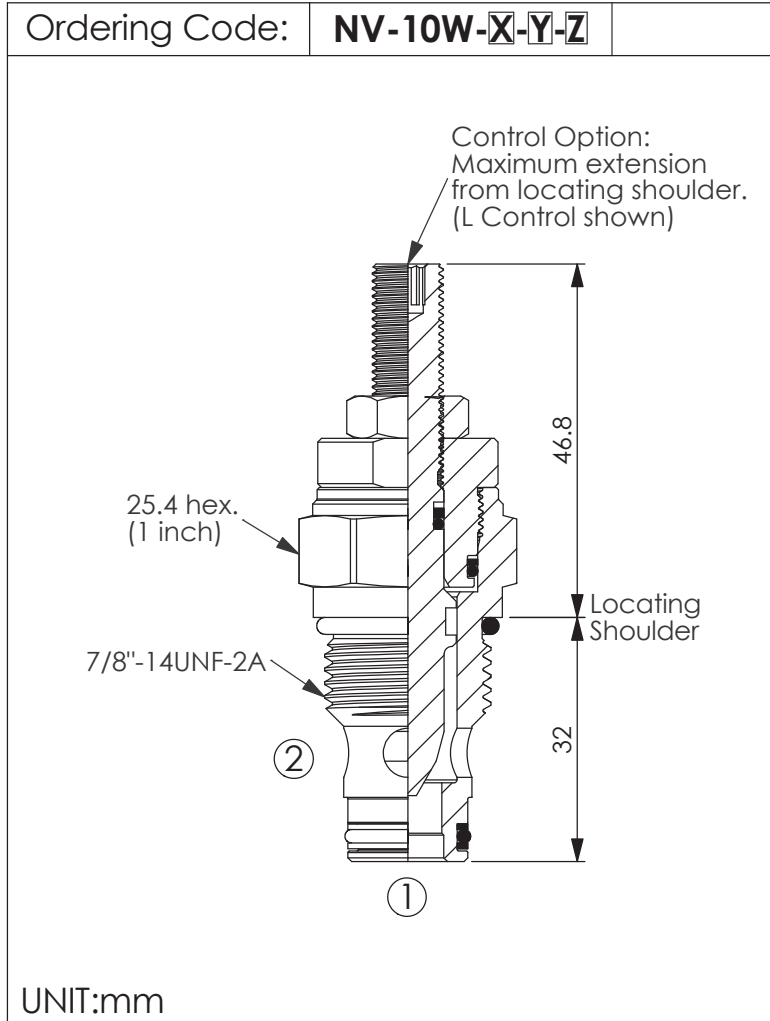
X OPERATION

20 Needle Valve

Z OPTIONS

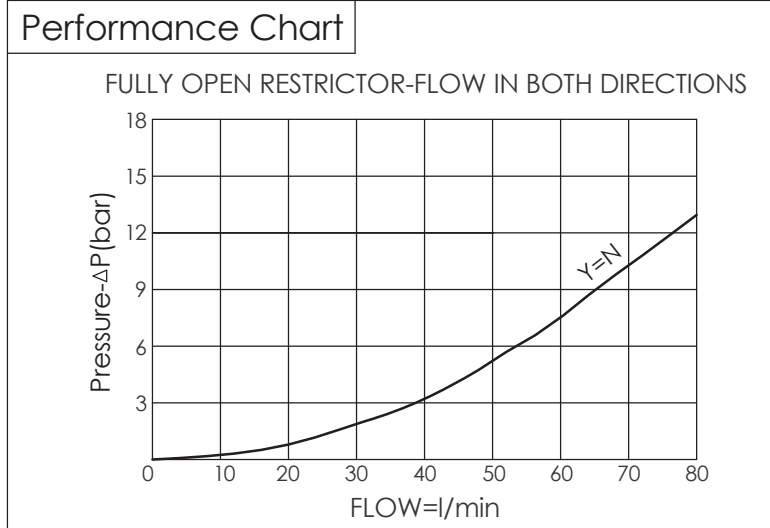
L	Leakproof hex. socket screw.	
K	Handknob with Lock Knob.	
E	Handknob and locknut.	
B	Handknob and aluminum locknut.	
T	Three-winged Handknob Kit.	

FLOW CONTROL VALVE (Fully Adjustable Needle with Standard Orifice)



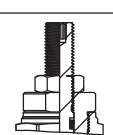
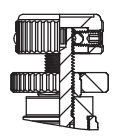
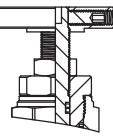
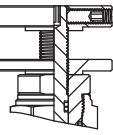
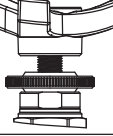
TECHNICAL DATA

Max. operating pressure:	350 bar
(Refer To Performance Chart)	
Rated Flow:	50 l/min
(Refer To Performance Chart)	
Cavity-Tooling:	10W-2
Installation torque:	35-45 Nm
Weight:	0.15 (Z:L) kg

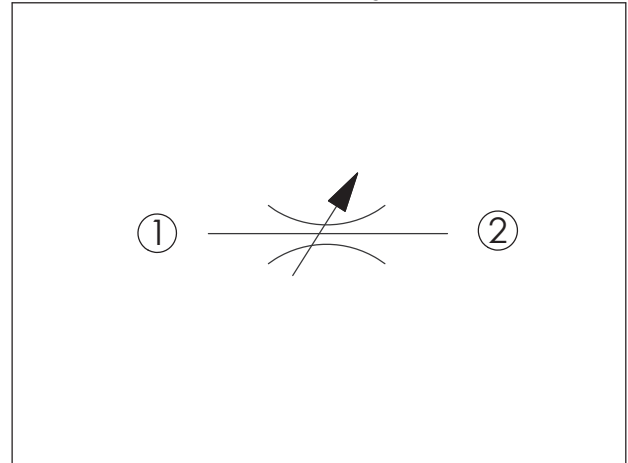
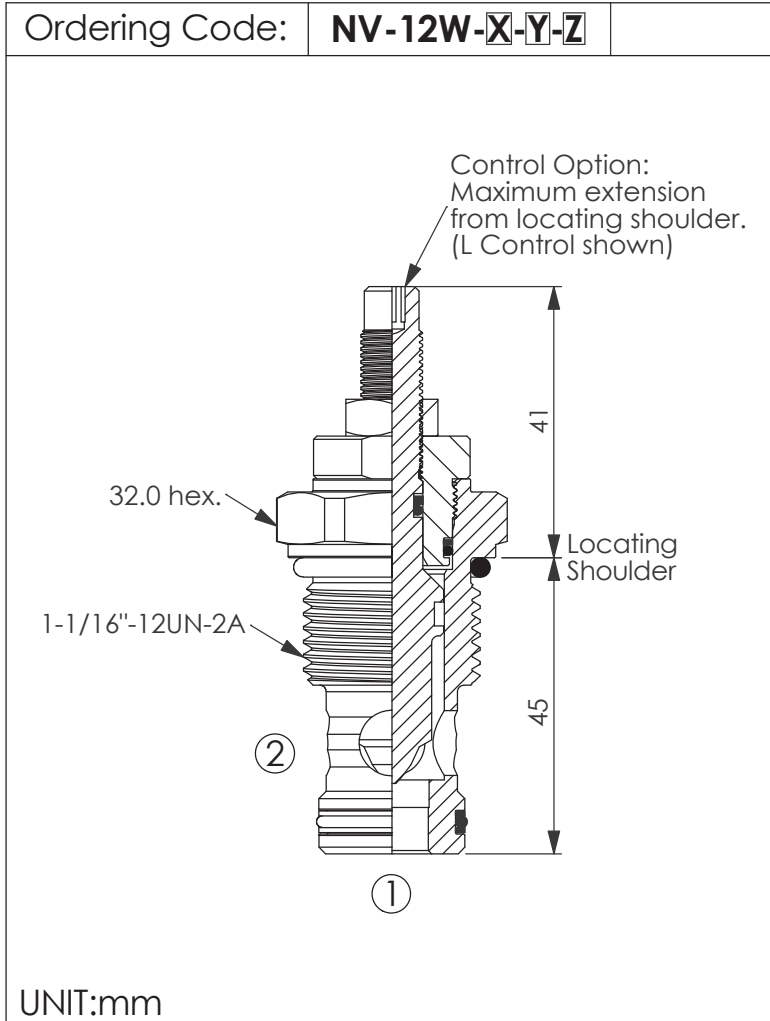


Y	MAXIMUM NOMINAL ORIFICE
N	Ø 7.2 mm

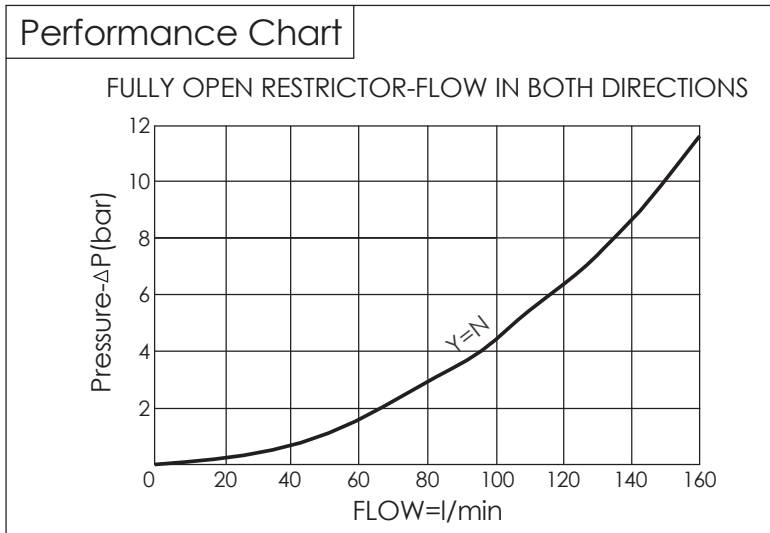
X	OPERATION
20	Needle Valve

Z	OPTIONS
L	Leakproof hex. socket screw. 
K	Handknob with Lock Knob. 
E	Handknob and locknut. 
B	Handknob and aluminum locknut. 
T	Three-winged Handknob Kit. 

FLOW CONTROL VALVE (Fully Adjustable Needle)



TECHNICAL DATA	
Max. operating pressure:	350 bar (Refer To Performance Chart)
Rated Flow:	126 l/min (Refer To Performance Chart)
Cavity-Tooling:	12W-2
Installation torque:	45-55 Nm
Weight:	0.21 (Z:L) kg



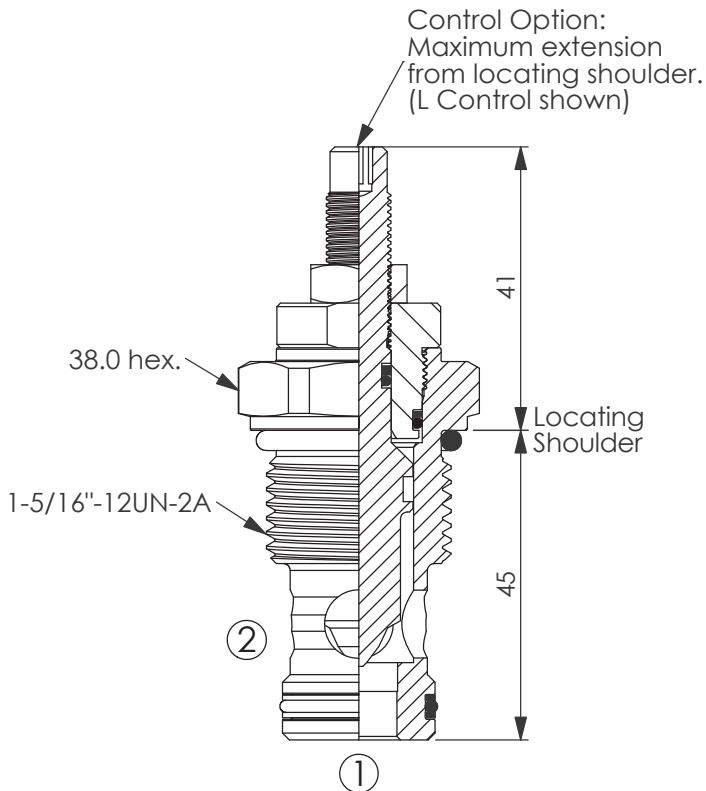
Y	MAXIMUM NOMINAL ORIFICE	
N	∅ 10.6 mm	

X	OPERATION	
20	Needle Valve	

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

FLOW CONTROL VALVE (Fully Adjustable Needle)

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



TECHNICAL DATA

Max. operating pressure: 350 bar
(Refer To Performance Chart)

Rated Flow: 165 l/min
(Refer To Performance Chart)

Cavity-Tooling: 16W-2

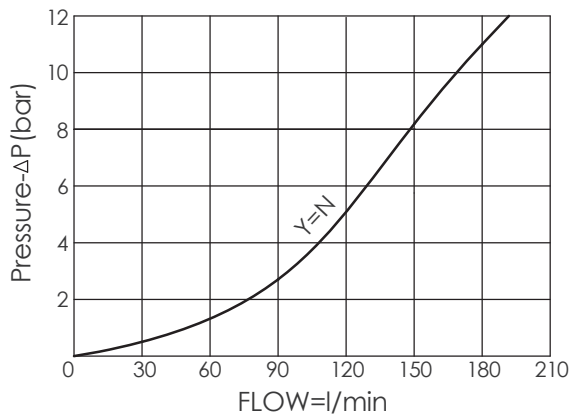
Installation torque: 60-70 Nm

Weight: 0.30 (Z:L) kg

UNIT:mm

Performance Chart

FULLY OPEN RESTRICTOR-FLOW IN BOTH DIRECTIONS



Y MAXIMUM NOMINAL ORIFICE

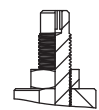
N ϕ 10.6 mm

X OPERATION

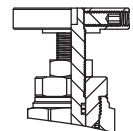
20 Needle Valve

Z OPTIONS

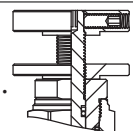
L Leakproof hex. socket screw.



E Handknob and locknut.



B Handknob and aluminum locknut.



FLOW CONTROL VALVE (Fully Adjustable Needle)

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

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

32.0 Hex.

G 3/4"

Locating Shoulder

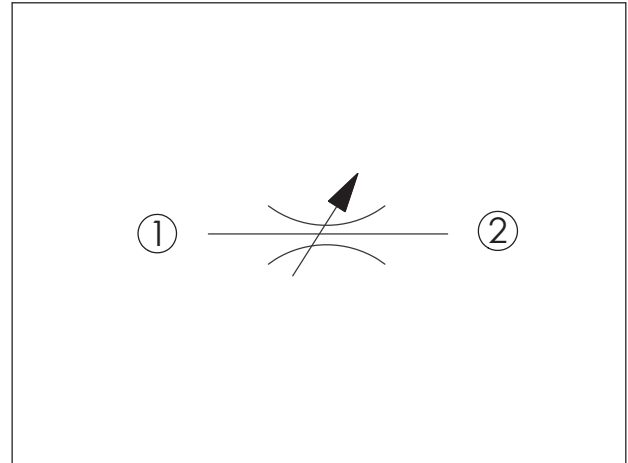
43

38

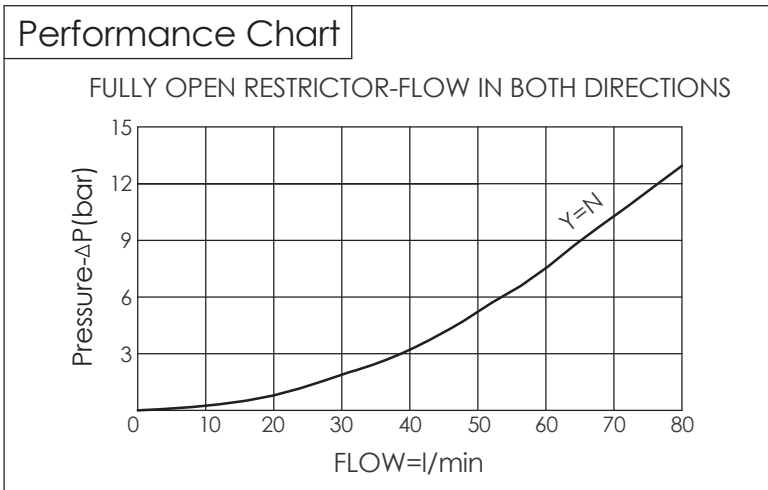
②

①

UNIT:mm



TECHNICAL DATA	
Max. operating pressure:	350 bar (Refer To Performance Chart)
Rated Flow:	58 l/min (Refer To Performance Chart)
Cavity-Tooling:	17E-2
Installation torque:	45-55 Nm
Weight:	0.20 (Z:L) kg



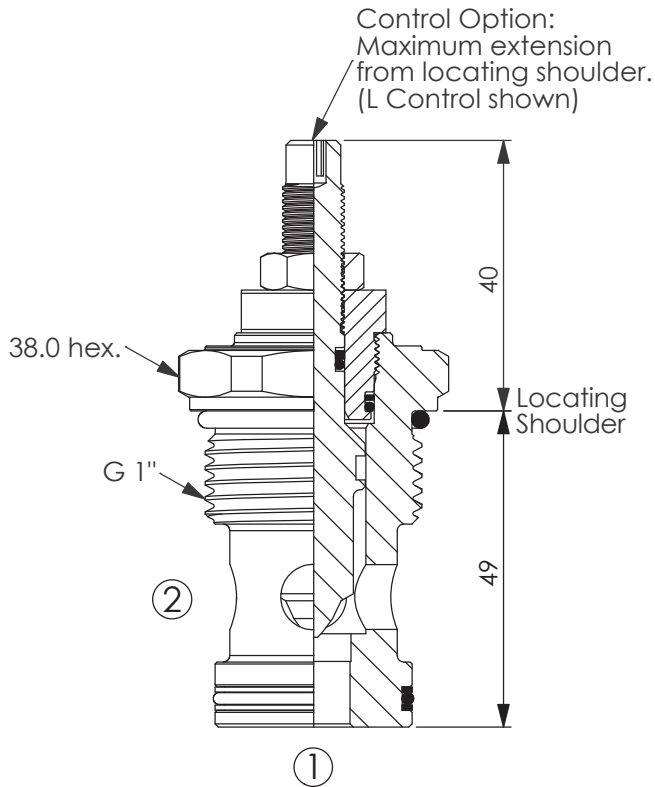
Y	MAXIMUM NOMINAL ORIFICE	
N	Ø 7.2 mm	

X	OPERATION	
20	Needle Valve	

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

FLOW CONTROL VALVE (Fully Adjustable Needle)

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



UNIT:mm



TECHNICAL DATA

Max. operating pressure: 350 bar
(Refer To Performance Chart)

Rated Flow: 126 l/min
(Refer To Performance Chart)

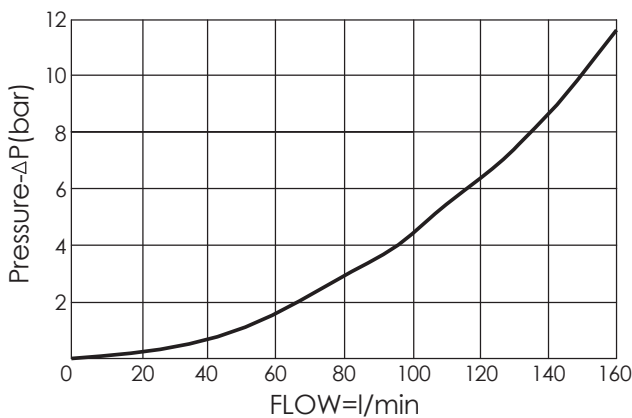
Cavity-Tooling: 21E-2

Installation torque: 70-90 Nm

Weight: 0.33 (Z:L) kg

Performance Chart

FULLY OPEN RESTRICTOR-FLOW IN BOTH DIRECTIONS



Y MAXIMUM NOMINAL ORIFICE

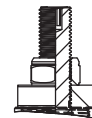
N ϕ 10.6 mm

X OPERATION

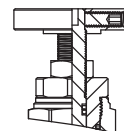
20 Needle Valve

Z OPTIONS

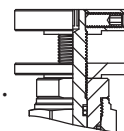
L Leakproof hex. socket screw.



E Handknob and locknut.



B Handknob and aluminum locknut.



FLOW CONTROL VALVE (Fully Adjustable Needle, Compact Design)

Ordering Code: **NV-162A-X-Y-Z**

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

19.05 Hex.
(3/4 inch)

M16x1.5

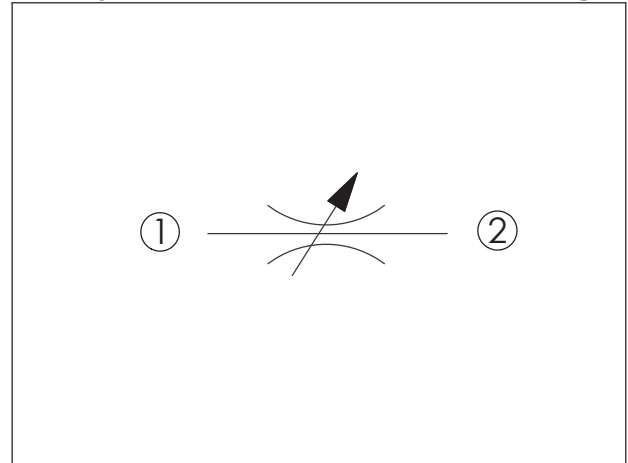
31

X:20=Z:L=34
X:20=Z:K=42
X:2S=Z:L=29

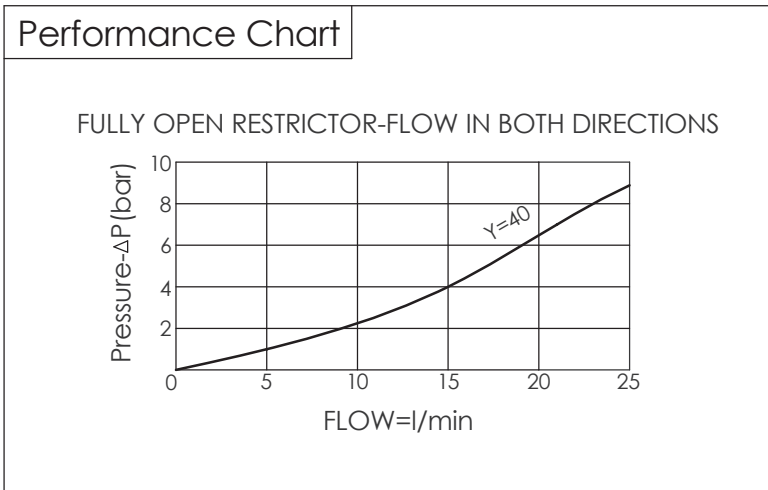
Locating
Shoulder

① ②

UNIT:mm



TECHNICAL DATA	
Max. operating pressure:	350 bar (Refer To Performance Chart)
Rated flow:	15 l/min (Refer To Performance Chart)
Cavity-Tooling:	162A-2
Installation torque:	27-33 Nm
Weight:	0.07 (Z:L) kg



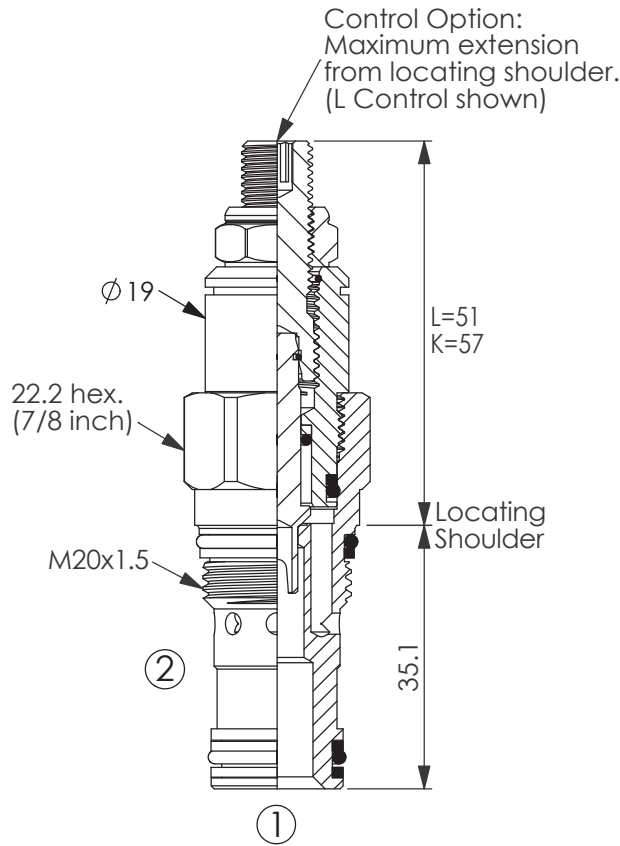
Y	MAXIMUM NOMINAL ORIFICE DIAMETER
40	∅ 4.0 mm

X	OPERATION
20	Needle Valve (Standard Type)
2S	Needle Valve (Short Spindle Type)

Z	OPTIONS
L	Leakproof hex. socket screw.
K	Handknob with Lock Knob. (Only X=20)

FLOW CONTROL VALVE (Fully Adjustable Needle with Sharp-Edge Orifice)

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



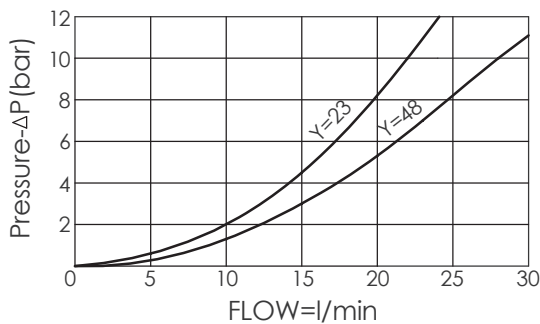
TECHNICAL DATA

Max. operating pressure:	350 bar	
	(Refer To Performance Chart)	
Rated flow:	25 l/min	
	(Refer To Performance Chart)	
Cavity-Tooling:	13A-2	
Installation torque:	40-50 Nm	
Weight:	0.15 (Z:L) kg	
	0.14 (Z:LP)	

UNIT:mm

Performance Chart

FULLY OPEN RESTRICTOR-FLOW IN BOTH DIRECTIONS



Y	MAXIMUM NOMINAL ORIFICE DIAMETER	
23	Ø 2.3 mm	
48	Ø 4.8 mm	

X OPERATION

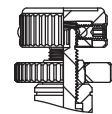
20 Fully Adjustable Needle with Sharp-Edge Orifice

Z OPTIONS

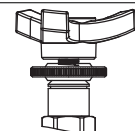
L Leakproof hex. socket screw.



K Handknob with Lock Knob.



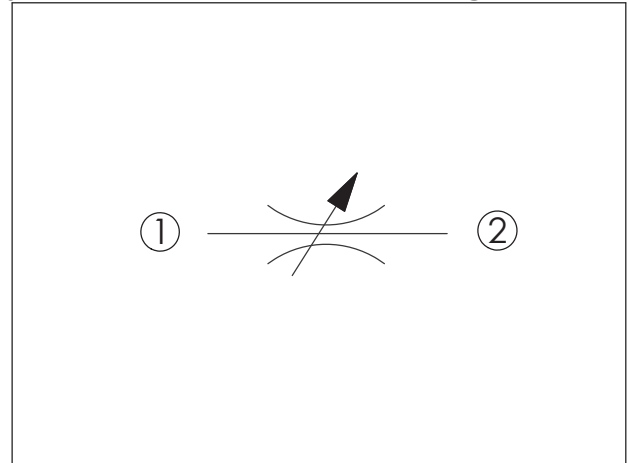
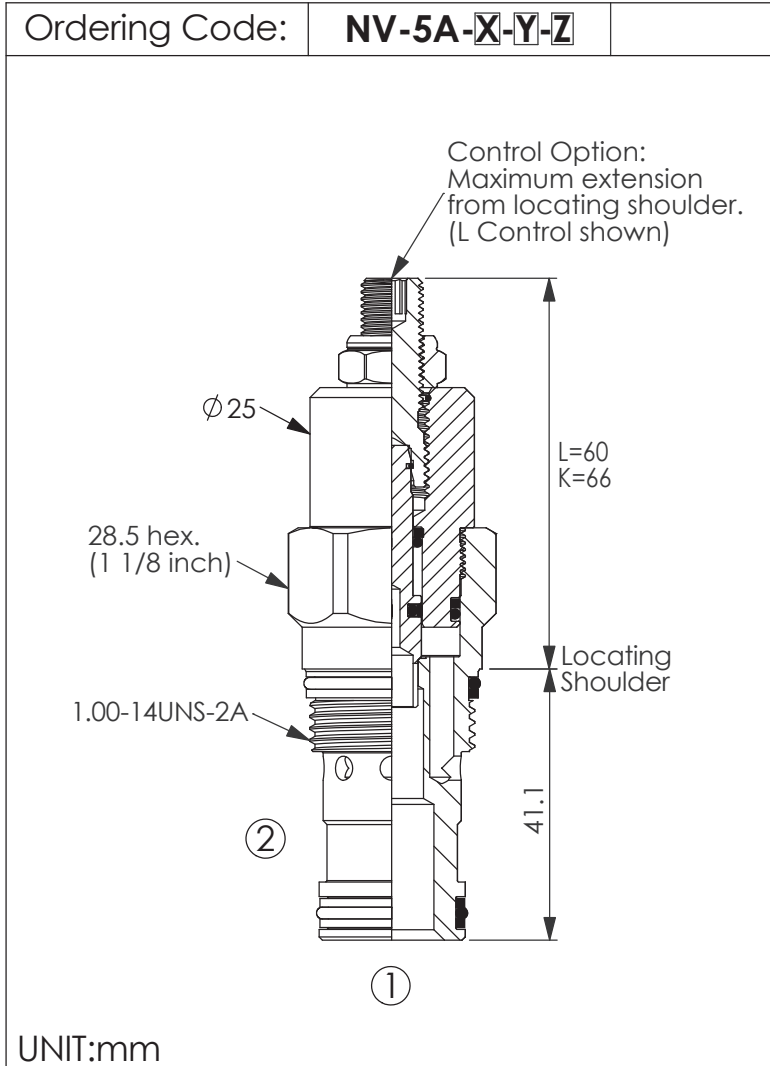
T Three-winged Handknob Kit.



LP Leakproof hex. socket screw. With stainless steel external metal components



FLOW CONTROL VALVE (Fully Adjustable Needle with Sharp-Edge Orifice)

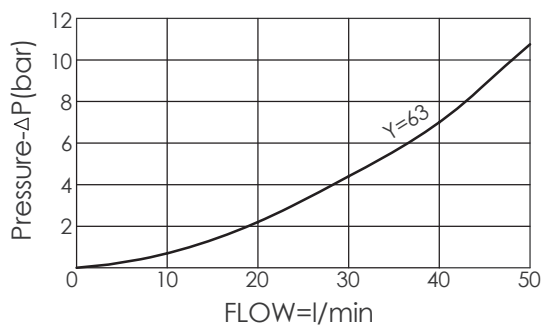


TECHNICAL DATA

Max. operating pressure:	350 bar
(Refer To Performance Chart)	
Rated Flow:	50 l/min
(Refer To Performance Chart)	
Cavity-Tooling:	5A-2
Installation torque:	60-70 Nm
Weight:	0.26 (Z:L) kg

Performance Chart

FULLY OPEN RESTRICTOR-FLOW IN BOTH DIRECTIONS



Y	MAXIMUM NOMINAL ORIFICE DIAMETER
33	Ø 3.3 mm
63	Ø 6.3 mm

X OPERATION

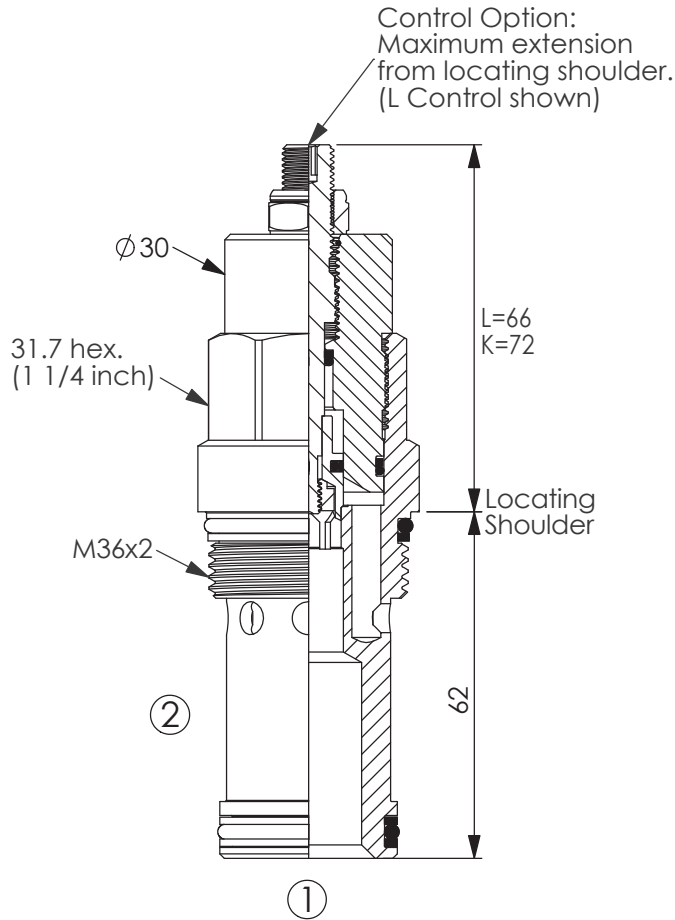
20	Fully Adjustable Needle with Sharp-Edge Orifice
----	---

Z OPTIONS

L	Leakproof hex. socket screw.	
K	Handknob with Lock Knob.	
T	Three-winged Handknob Kit.	

FLOW CONTROL VALVE (Fully Adjustable Needle with Sharp-Edge Orifice)

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



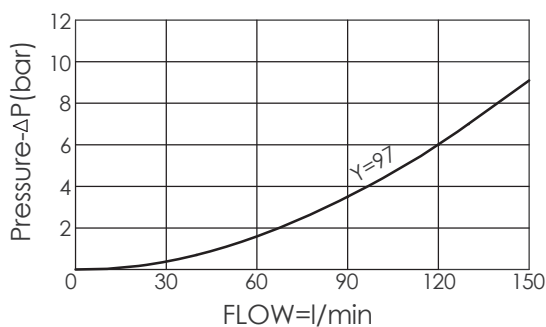
TECHNICAL DATA

Max. operating pressure:	350 bar
(Refer To Performance Chart)	
Rated Flow:	100 l/min
(Refer To Performance Chart)	
Cavity-Tooling:	16A-2
Installation torque:	200-215 Nm
Weight:	0.51 (Z:L) kg

UNIT:mm

Performance Chart

FULLY OPEN RESTRICTOR-FLOW IN BOTH DIRECTIONS



X OPERATION

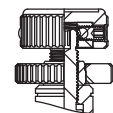
20 Fully Adjustable Needle with Sharp-Edge Orifice

Z OPTIONS

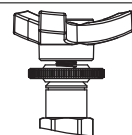
L Leakproof hex. socket screw.



K Handknob with Lock Knob.



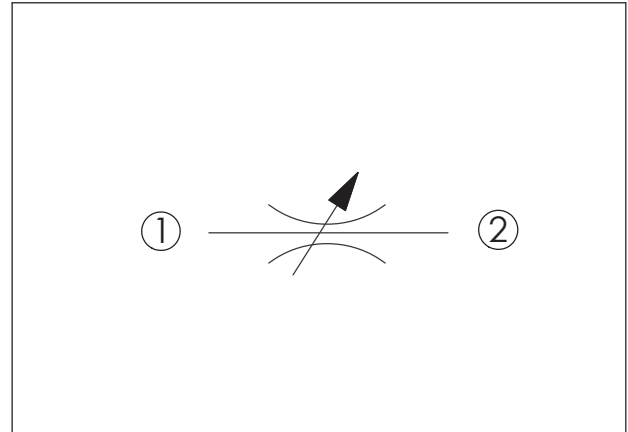
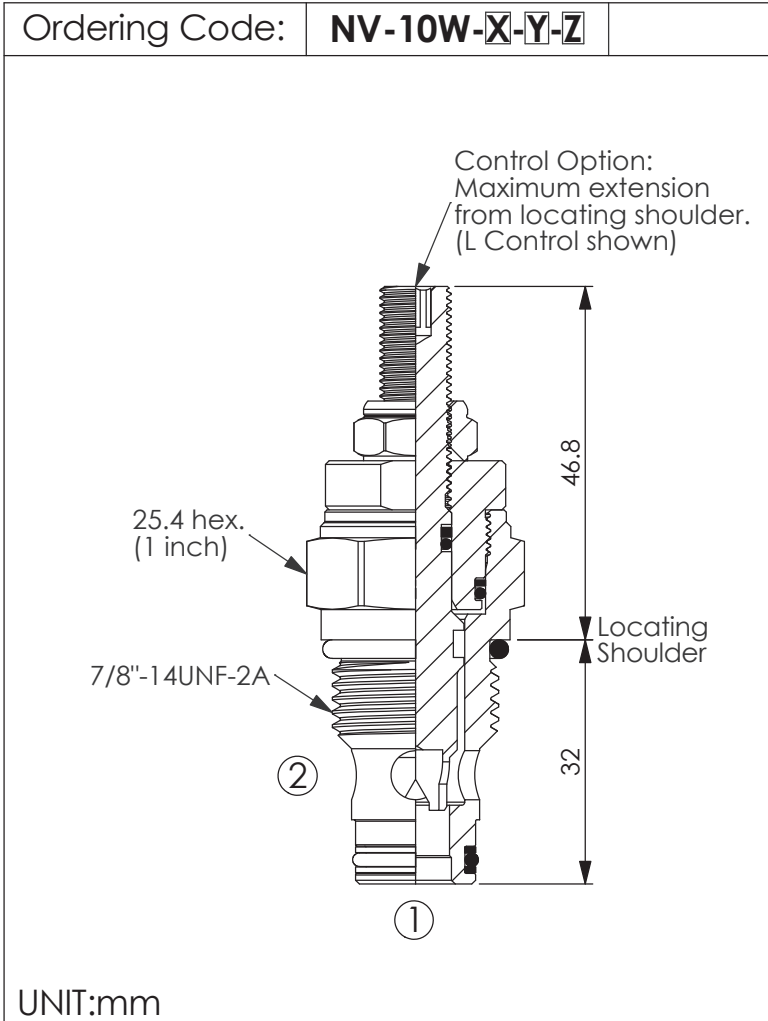
T Three-winged Handknob Kit.



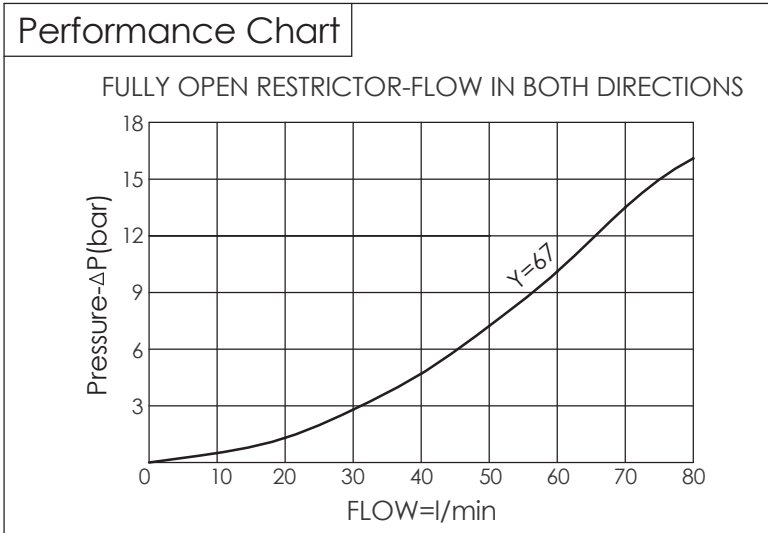
Y MAXIMUM NOMINAL ORIFICE DIAMETER

97 ϕ 9.7 mm

FLOW CONTROL VALVE (Fully Adjustable Needle with Low Noise and Sharp-Edge Orifice)



TECHNICAL DATA	
Max. operating pressure:	350 bar (Refer To Performance Chart)
Rated Flow:	50 l/min (Refer To Performance Chart)
Cavity-Tooling:	10W-2
Installation torque:	35-45 Nm
Weight:	0.15 (Z:L) kg



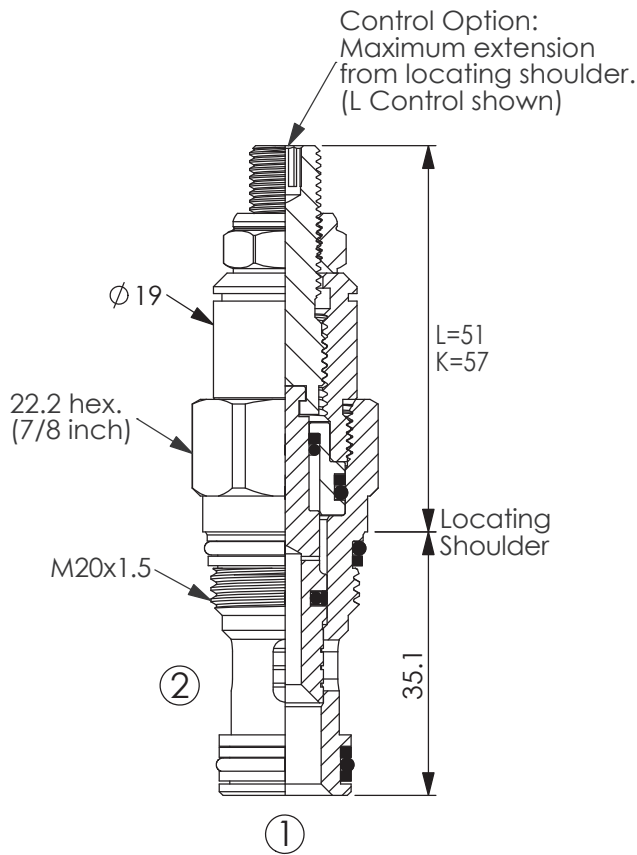
X	OPERATION	
20	Fully Adjustable Needle with Sharp-Edge Orifice	

Y	MAXIMUM NOMINAL ORIFICE	
67	∅ 6.7 mm	

Z	OPTIONS	
L	Leakproof hex. socket screw.	
K	Handknob with Lock Knob.	
E	Handknob and locknut.	
B	Handknob and aluminum locknut.	
T	Three-winged Handknob Kit.	

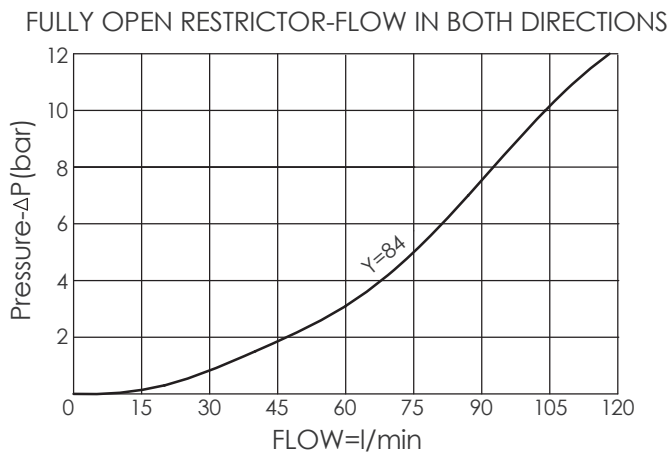
FLOW CONTROL VALVE (Fully Adjustable Needle Valve, High Capacity)

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



UNIT:mm

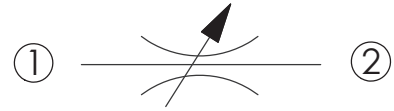
Performance Chart



Y MAXIMUM NOMINAL ORIFICE DIAMETER

84

Ø 8.4 mm



TECHNICAL DATA

Max. operating pressure: 350 bar
(Refer To Performance Chart)

Rated flow: 80 l/min
(Refer To Performance Chart)

Cavity-Tooling: 13A-2

Installation torque: 40-50 Nm

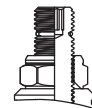
Weight: 0.15 (Z:L) kg
0.14 (Z:LP)

X OPERATION

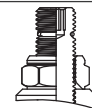
28 Fully Adjustable
Needle Valve

Z OPTIONS

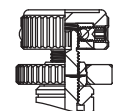
L Leakproof hex.
socket screw.



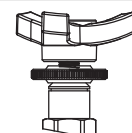
LP Leakproof hex.
socket screw.
With stainless steel
external metal components



K Handknob with
Lock Knob.



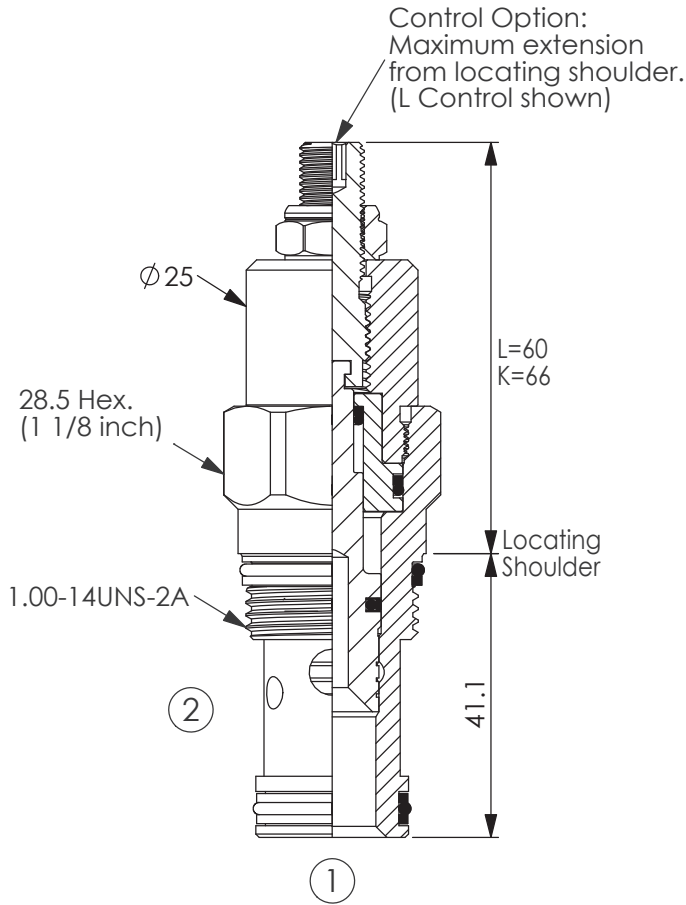
T Three-winged
Handknob Kit.



FLOW CONTROL VALVE

(Fully Adjustable Needle Valve, High Capacity)

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



UNIT:mm



TECHNICAL DATA

Max. operating pressure: 350 bar
(Refer To Performance Chart)

Rated flow: 170 l/min
(Refer To Performance Chart)

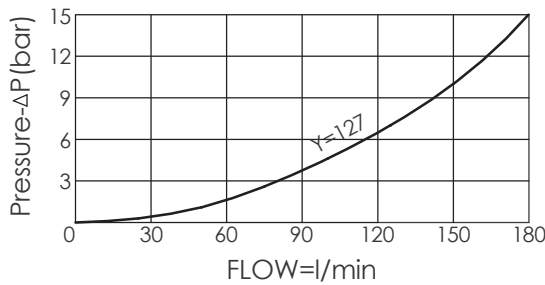
Cavity-Tooling: 5A-2

Installation torque: 60-70 Nm

Weight: 0.27 (Z:L) kg

Performance Chart

FULLY OPEN RESTRICTOR-FLOW IN BOTH DIRECTIONS



Y MAXIMUM NOMINAL ORIFICE DIAMETER

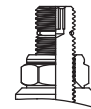
127 φ 12.7 mm

X OPERATION

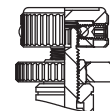
28 Fully Adjustable Needle Valve

Z OPTIONS

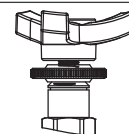
L Leakproof hex. socket screw.



K Handknob with Lock Knob.

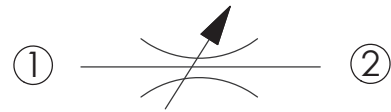
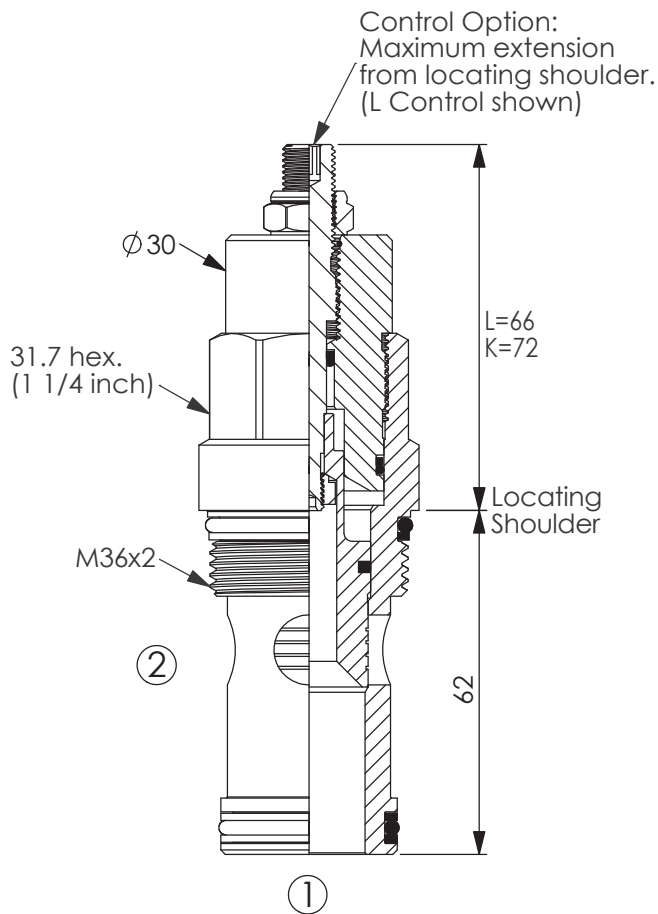


T Three-winged Handknob Kit.



FLOW CONTROL VALVE (Fully Adjustable Needle Valve, High Capacity)

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



TECHNICAL DATA

Max. operating pressure: 350 bar
(Refer To Performance Chart)

Rated flow: 340 l/min
(Refer To Performance Chart)

Cavity-Tooling: 16A-2

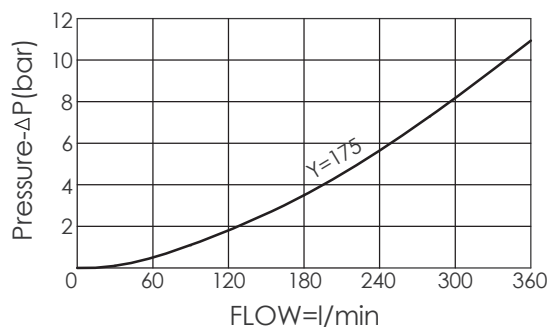
Installation torque: 200-215 Nm

Weight: 0.55 (Z:L) kg

UNIT:mm

Performance Chart

FULLY OPEN RESTRICTOR-FLOW IN BOTH DIRECTIONS



Y MAXIMUM NOMINAL ORIFICE DIAMETER

175 Ø 17.5 mm

X OPERATION

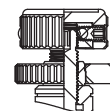
28 Fully Adjustable
Needle Valve

Z OPTIONS

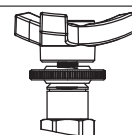
L Leakproof hex.
socket screw.



K Handknob with
Lock Knob.

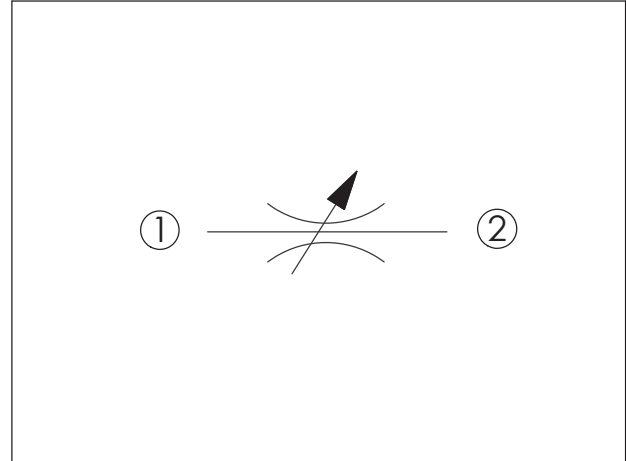
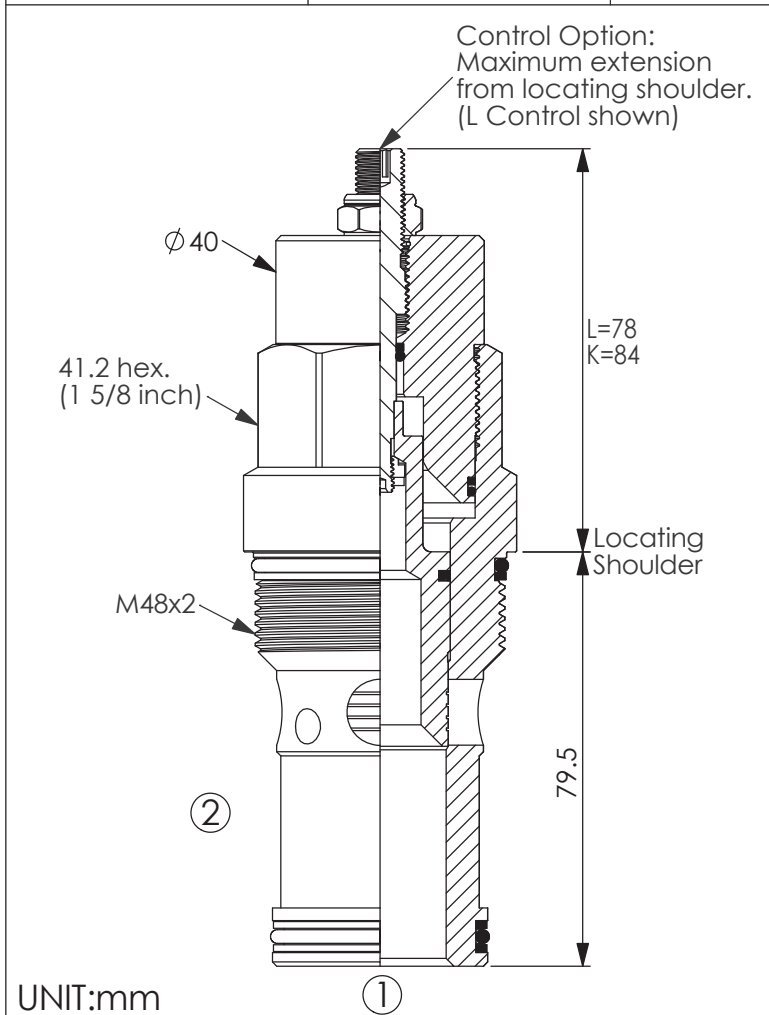


T Three-winged
Handknob Kit.



FLOW CONTROL VALVE (Fully Adjustable Needle Valve, High Capacity)

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

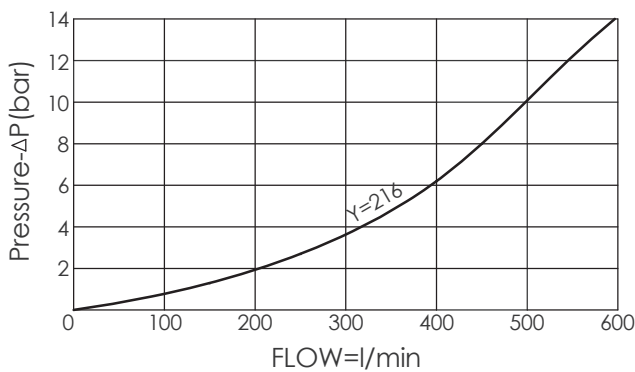


TECHNICAL DATA

Max. operating pressure:	350 bar
(Refer To Performance Chart)	
Rated flow:	520 l/min
(Refer To Performance Chart)	
Cavity-Tooling:	18A-2
Installation torque:	475-500 Nm
Weight:	1.24 (Z:L) kg

Performance Chart

FULLY OPEN RESTRICTOR-FLOW IN BOTH DIRECTIONS



Y MAXIMUM NOMINAL ORIFICE DIAMETER

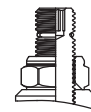
216 Ø 21.6 mm

X OPERATION

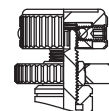
28 Fully Adjustable
Needle Valve

Z OPTIONS

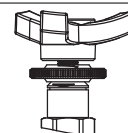
L Leakproof hex.
socket screw.



K Handknob with
Lock Knob.

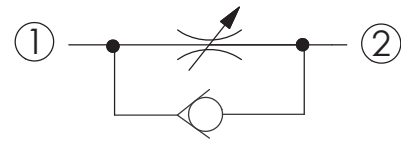
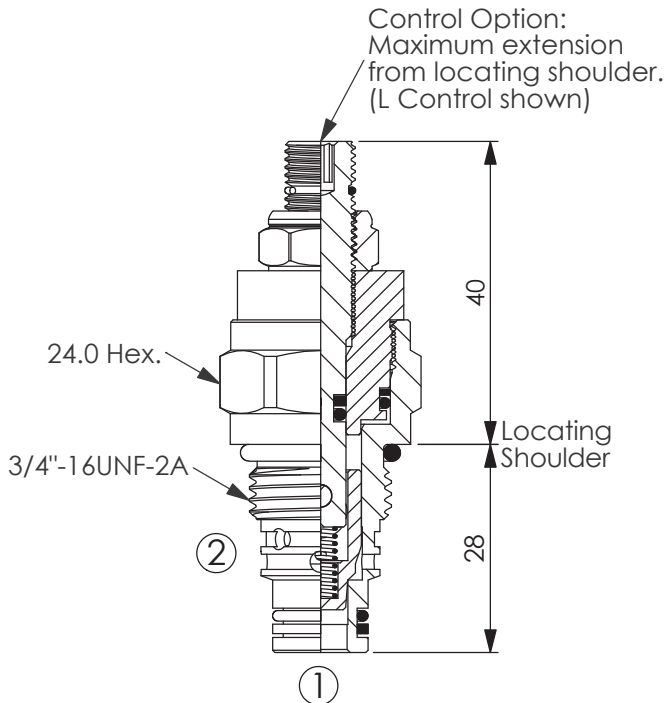


T Three-winged
Handknob Kit.



FLOW CONTROL VALVE (Fully Adjustable Needle with Reverse Flow Check)

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

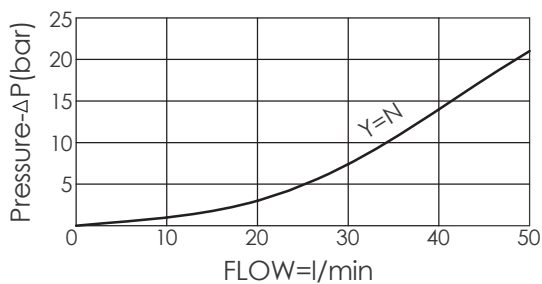


TECHNICAL DATA

Max. operating pressure:	350 bar
(Refer To Performance Chart)	
Rated Flow:	35 l/min
(Refer To Performance Chart)	
Cavity-Tooling:	08W-2
Installation torque:	25-35 Nm
Weight:	0.11 (Z:L) kg

UNIT:mm

Performance Chart

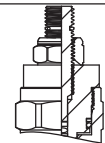


X OPERATION

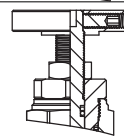
20 1 to 2 (Free Flow)

Z OPTIONS

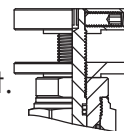
L Leakproof hex. socket screw.



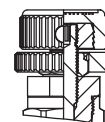
E Handknob and locknut.



B Handknob and aluminum locknut.



K Handknob with Lock Knob.



Y MAXIMUM NOMINAL ORIFICE

N ϕ 5.0 mm
(Port 2 To Port 1)

FLOW CONTROL VALVE

(Fully Adjustable Needle with Reverse Flow Check)

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

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

25.4 Hex.
(1 inch)

7/8"-14UNF-2A

41

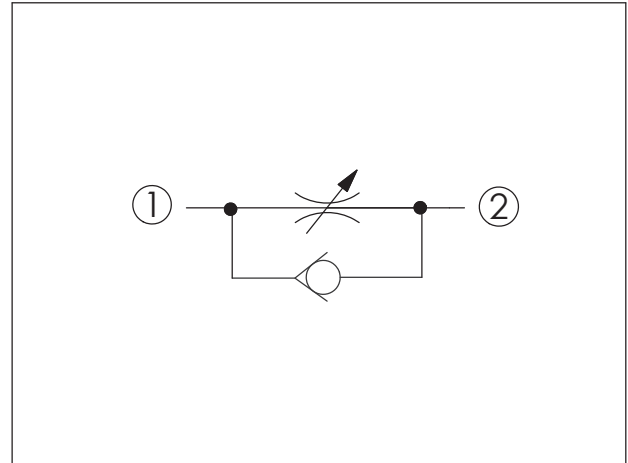
Locating
Shoulder

32

②

①

UNIT:mm



TECHNICAL DATA

Max. operating pressure: 350 bar
(Refer To Performance Chart)

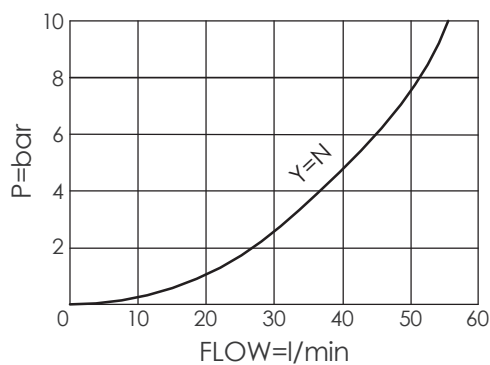
Rated Flow: 45 l/min
(Refer To Performance Chart)

Cavity-Tooling: 10W-2

Installation torque: 35-45 Nm

Weight: 0.15 (Z:L) kg

Performance Chart



X

OPERATION

20

1 to 2 (Free Flow)

Z

OPTIONS

L

Leakproof hex.
socket screw.



Y

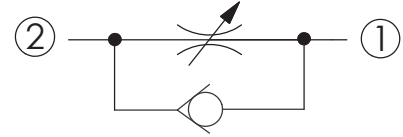
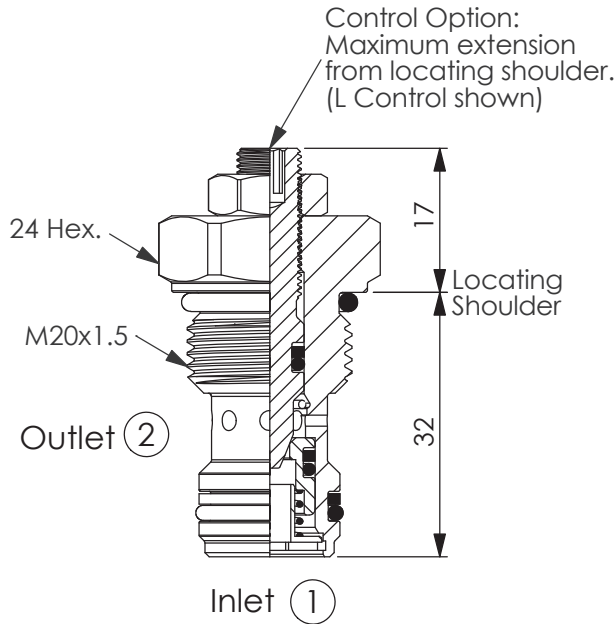
MAXIMUM NOMINAL ORIFICE

N

∅ 6.5 mm
(Port 2 To Port 1)

FLOW CONTROL VALVE (Fully Adjustable Needle with Reverse Flow Check)

Ordering Code: **NC-20MC-X-Y-Z**

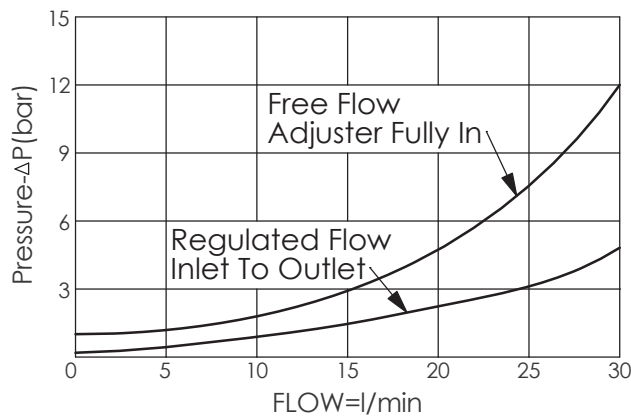


TECHNICAL DATA

Max. operating pressure:	350 bar
(Refer To Performance Chart)	
Rated flow:	30 l/min
(Refer To Performance Chart)	
Cavity-Tooling:	20MC-2
Installation torque:	39-51 Nm
Weight:	0.08 (Z:L) kg

UNIT:mm

Performance Chart

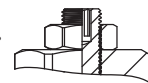


X OPERATION

21 2 to 1 (Free Flow)

Z OPTIONS

L Leakproof hex. socket screw.



Y

OPTIONS

Maximum Nominal Orifice	Cracking Pressure
-------------------------	-------------------

DD

∅ 5.2 mm

3.5 bar

FLOW CONTROL VALVE

(Fully Adjustable Needle with Reverse Flow Check)

Ordering Code: **NC-162A-X-Y-Z**

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

19.05 Hex.
(3/4 inch)

L=40.4
K=45

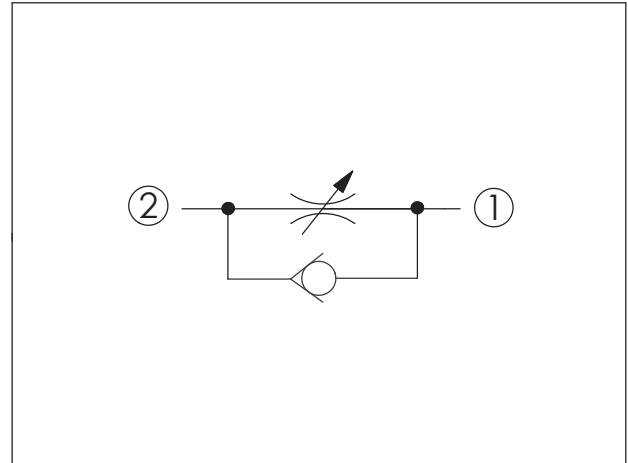
Locating
Shoulder

M16x1.5

Port ②

Port ①

UNIT:mm



TECHNICAL DATA

Max. operating pressure: 350 bar
(Refer To Performance Chart)

Rated flow: 15 l/min
(Refer To Performance Chart)

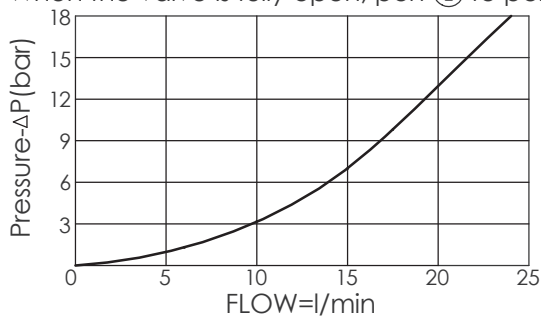
Cavity-Tooling: 162A-2

Installation torque: 27-33 Nm

Weight: 0.07 (Z:L) kg

Performance Chart

When the valve is fully open, port ① to port ②



X

OPERATION

21

2 to 1 (Free Flow)

Y

OPTIONS

Maximum Nominal Orifice
(Refer To Performance Chart)

Cracking Pressure

BC

∅ 4.0 mm

2.0 bar

Z

OPTIONS

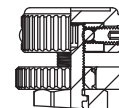
L

Leakproof hex.
socket screw.

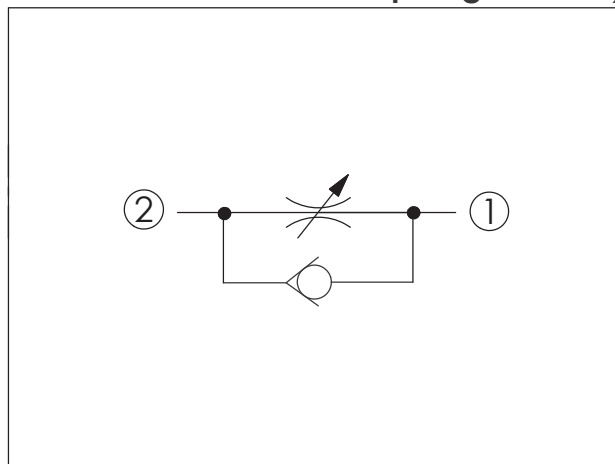
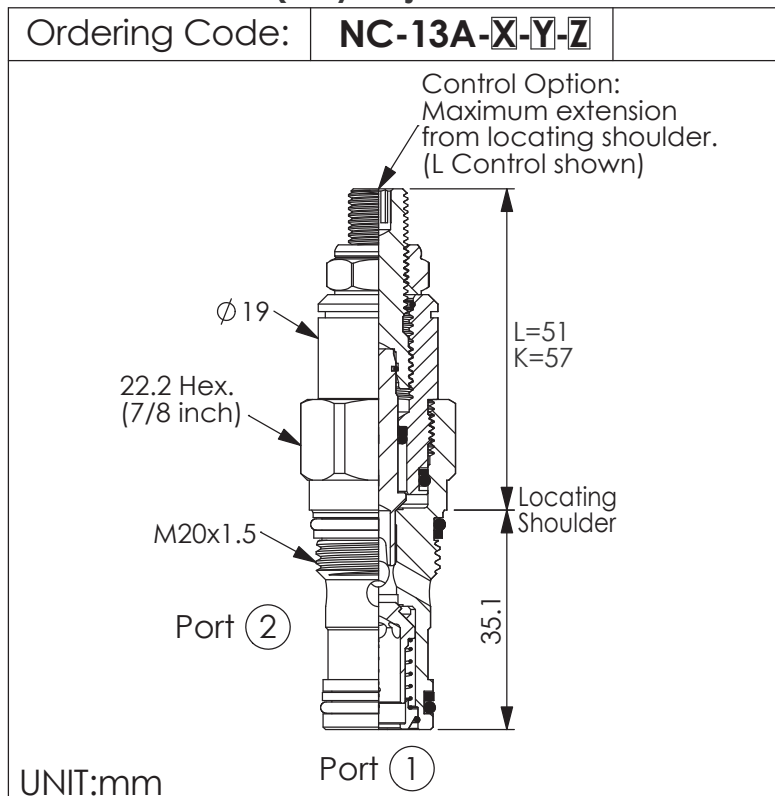


K

Handknob with
Lock Knob.



FLOW CONTROL VALVE (Fully Adjustable Needle with Reverse Flow Check and Sharp-Edge Orifice)



TECHNICAL DATA

Max. operating pressure: 350 bar
(Refer To Performance Chart)

Rated flow: 25 l/min
(Refer To Performance Chart)

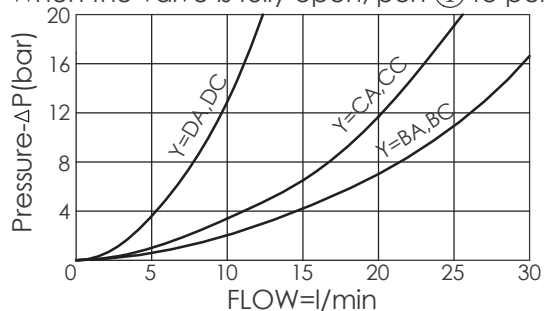
Cavity-Tooling: 13A-2

Installation torque: 40-50 Nm

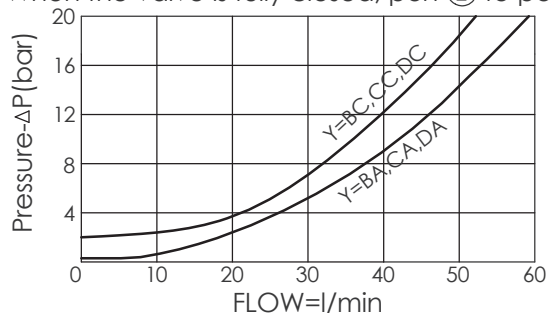
Weight: 0.14 (Z:L) kg

Performance Chart

When the valve is fully open, port ① to port ②



When the valve is fully closed, port ② to port ①



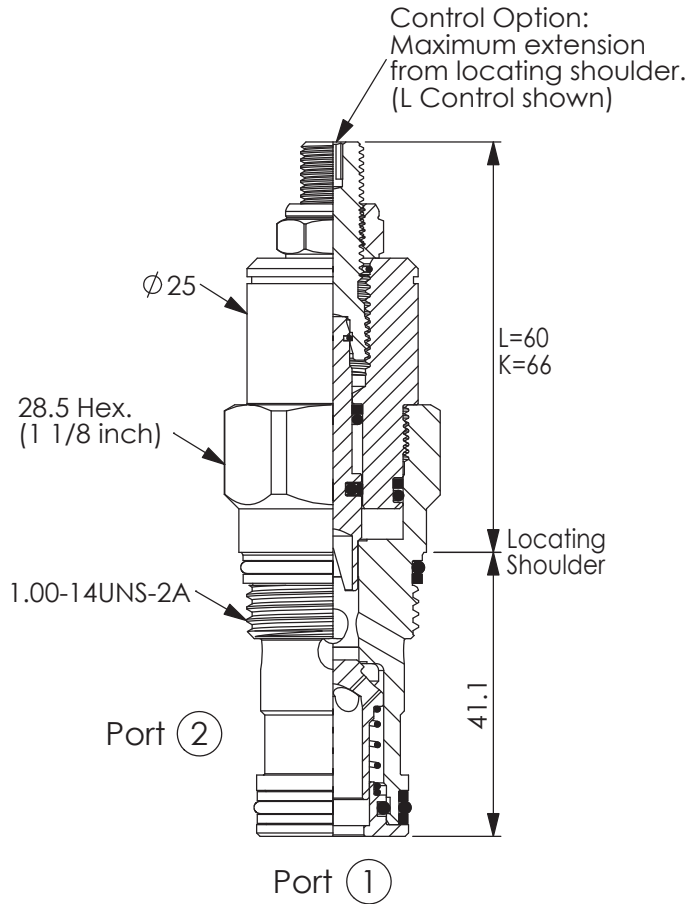
X	OPERATION	
21	2 to 1 (Free Flow)	

Z	OPTIONS	
L	Leakproof hex. socket screw.	
K	Handknob with Lock Knob.	
T	Three-winged Handknob Kit.	

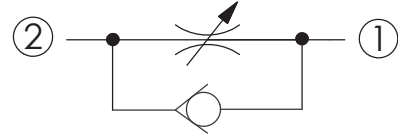
Y	OPTIONS	
	Maximum Nominal Orifice (Refer To Performance Chart)	Cracking Pressure
BA	Ø 4.8 mm	0.3 bar
BC	Ø 4.8 mm	2.0 bar
CA	Ø 2.3 mm	0.3 bar
CC	Ø 2.3 mm	2.0 bar
DA	Ø 1.5 mm	0.3 bar
DC	Ø 1.5 mm	2.0 bar

FLOW CONTROL VALVE (Fully Adjustable Needle with Reverse Flow Check and Sharp-Edge Orifice)

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



UNIT:mm

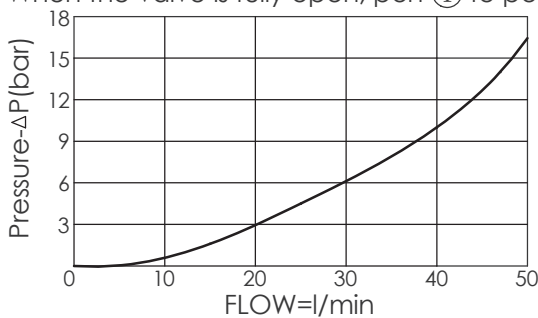


TECHNICAL DATA

Max. operating pressure:	350 bar
(Refer To Performance Chart)	
Rated flow:	50 l/min
(Refer To Performance Chart)	
Cavity-Tooling:	5A-2
Installation torque:	60-70 Nm
Weight:	0.27 (Z:L) kg

Performance Chart

When the valve is fully open, port ① to port ②



X

OPERATION

21 2 to 1 (Free Flow)

Z

OPTIONS

L	Leakproof hex. socket screw.	
LP	Leakproof hex. socket screw. With stainless steel external metal components	
K	Handknob with Lock Knob.	
T	Three-winged Handknob Kit.	

Y

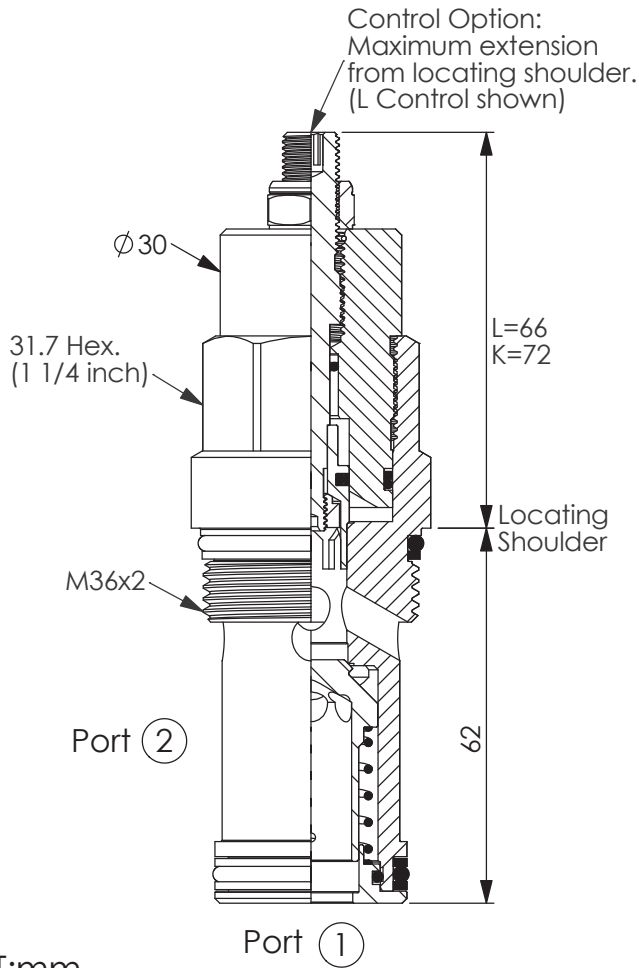
OPTIONS

Maximum Nominal Orifice (Refer To Performance Chart) Cracking Pressure

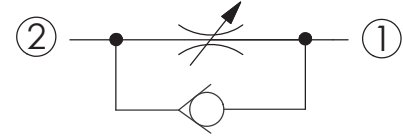
BA	Ø6.4 mm	0.3 bar
BC	Ø6.4 mm	2.0 bar

FLOW CONTROL VALVE (Fully Adjustable Needle with Reverse Flow Check and Sharp-Edge Orifice)

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



UNIT:mm



TECHNICAL DATA

Max. operating pressure: 350 bar
(Refer To Performance Chart)

Rated flow: 120 l/min
(Refer To Performance Chart)

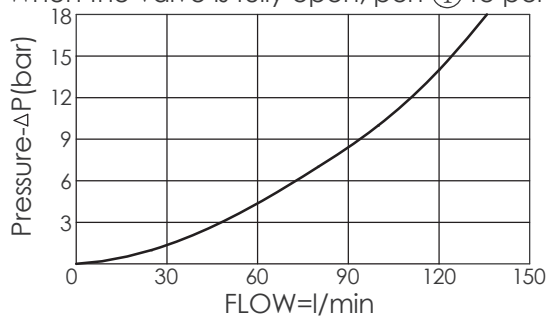
Cavity-Tooling: 16A-2

Installation torque: 200-215 Nm

Weight: 0.55 (Z:L) kg

Performance Chart

When the valve is fully open, port ① to port ②



X OPERATION

21 2 to 1 (Free Flow)

Y

OPTIONS

Maximum Nominal Orifice
(Refer To Performance Chart)

Cracking Pressure

BC

Ø9.7 mm

2.0 bar

Z

OPTIONS

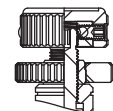
L

Leakproof hex.
socket screw.



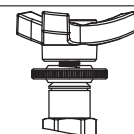
K

Handknob with
Lock Knob.

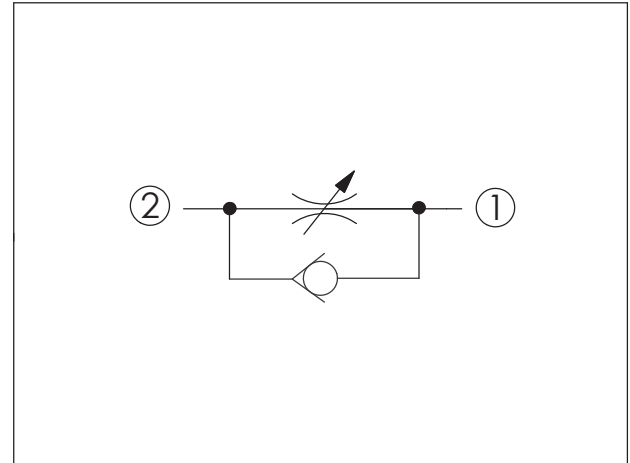
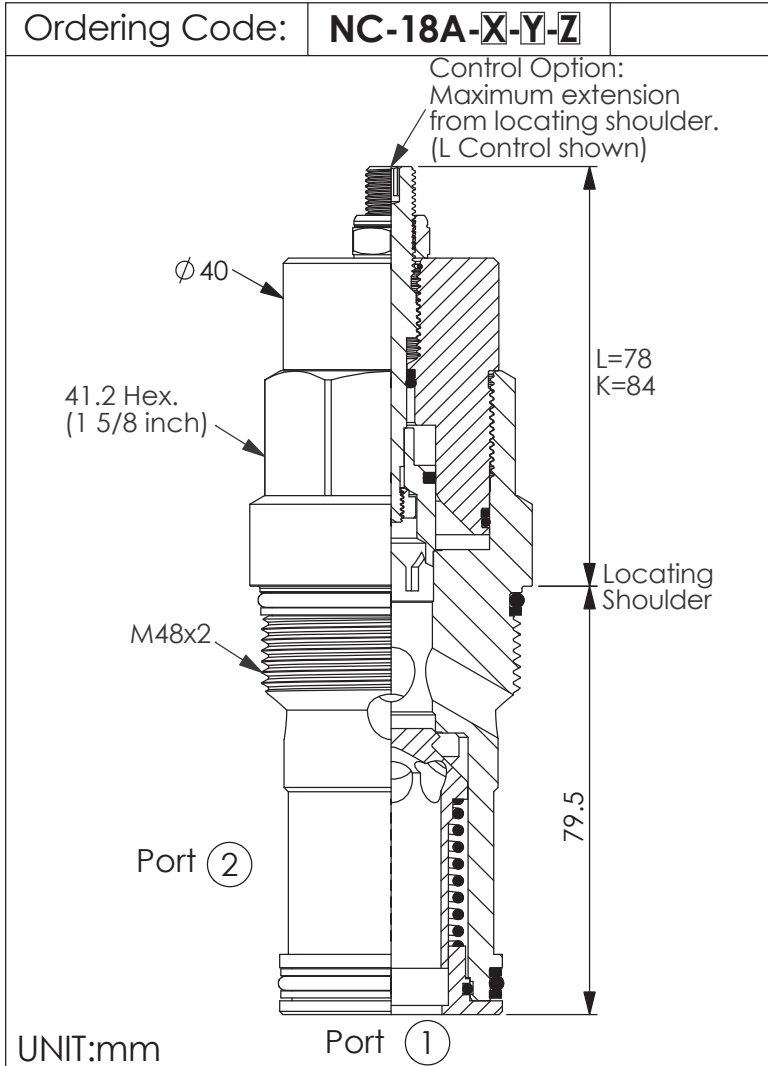


T

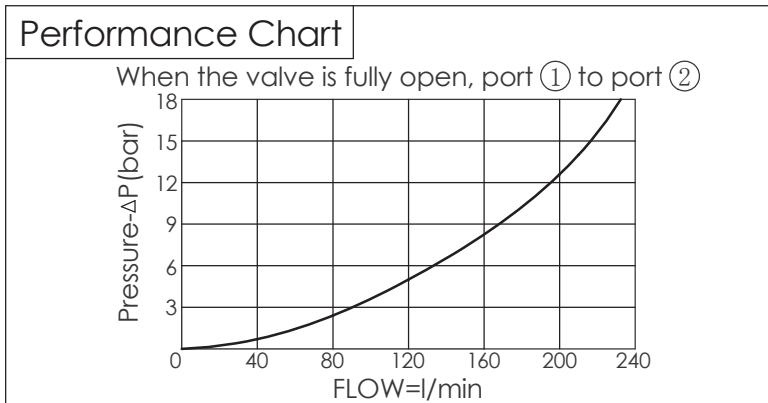
Three-winged
Handknob Kit.



FLOW CONTROL VALVE (Fully Adjustable Needle with Reverse Flow Check and Sharp-Edge Orifice)



TECHNICAL DATA	
Max. operating pressure:	350 bar (Refer To Performance Chart)
Rated flow:	210 l/min (Refer To Performance Chart)
Cavity-Tooling:	18A-2
Installation torque:	475-500 Nm
Weight:	1.22 (Z:L) kg

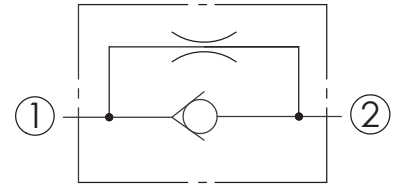
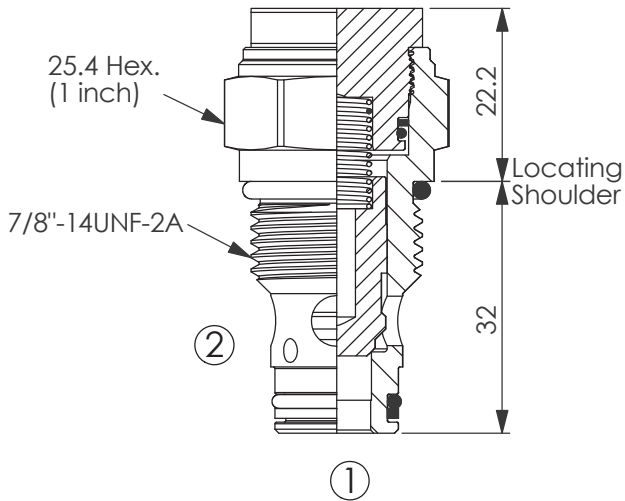


X	OPERATION	
21	2 to 1 (Free Flow)	

Y	OPTIONS	
	Maximum Nominal Orifice (Refer To Performance Chart)	Cracking Pressure
BC	Ø 14.2 mm	2.0 bar

Z	OPTIONS	
L	Leakproof hex. socket screw.	
K	Handknob with Lock Knob.	
T	Three-winged Handknob Kit.	

Ordering Code: **NC-10W-X-Y-N-Z**



TECHNICAL DATA

Max. operating pressure: 350 bar
(Refer To Performance Chart)

Rated flow: ①to② 60 l/min
(Refer To Performance Chart)

Cavity-Tooling: 10W-2

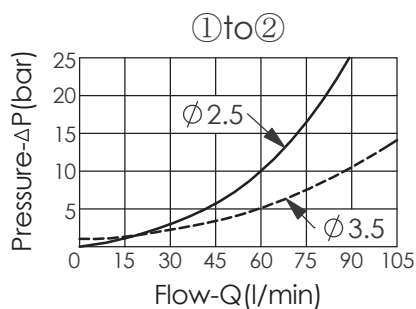
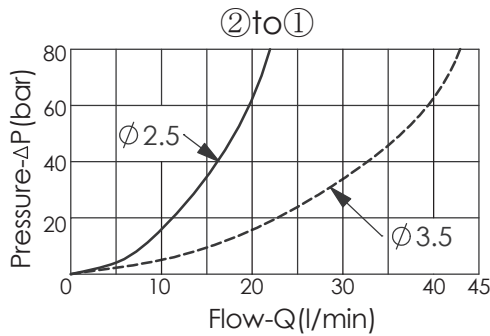
Installation torque: 35-45 Nm

Weight: 0.09 kg

UNIT:mm

Performance Chart

Z=03



X OPERATION

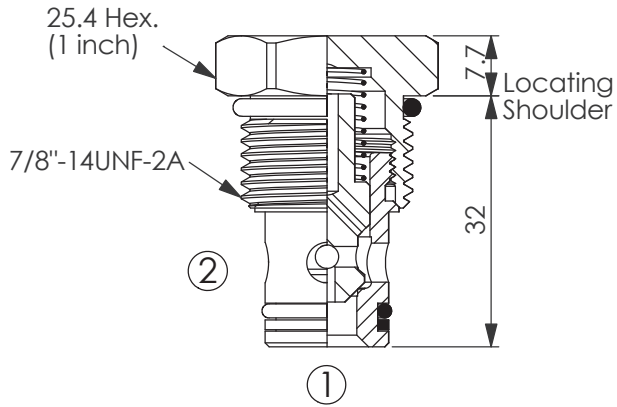
22 Standard Type

Y	OPTIONS	
	Orifice Diameter (Port ② to ①)	
15	Ø 1.5 mm	
25	Ø 2.5 mm	
35	Ø 3.5 mm	
50	Ø 5.0 mm	

Z	OPTIONS	
	Cracking Pressure (Port ①to②)	
03	0.3 bar	
10	1.0 bar	
50	5.0 bar	

FLOW CONTROL VALVE (Fixed Orifice, Non-Pressure Compensated, With Reverse Flow Check)

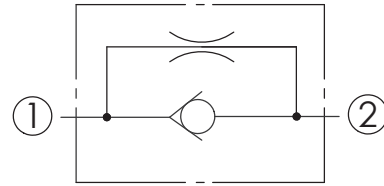
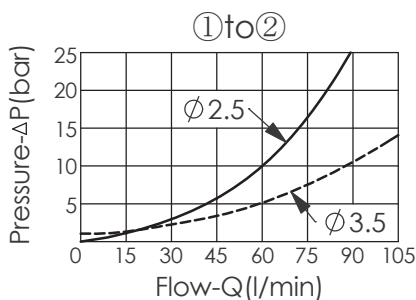
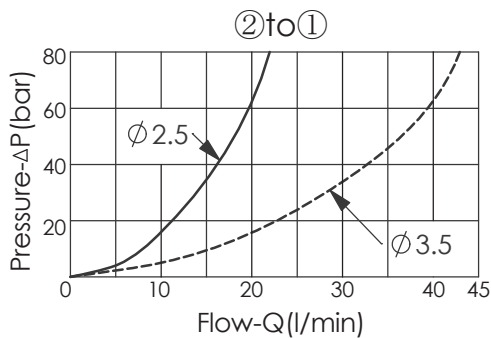
Ordering Code: **NC-10W-X-Y-N-Z**



UNIT:mm

Performance Chart

Z=03



TECHNICAL DATA

Max. operating pressure: 350 bar
(Refer To Performance Chart)

Rated flow: ①to② 60 l/min
(Refer To Performance Chart)

Cavity-Tooling: 10W-2

Installation torque: 35-45 Nm

Weight: 0.07 kg

X OPERATION

20 Standard Type

Y OPTIONS

Orifice Diameter (Port ② to ①)

15	φ 1.5 mm
25	φ 2.5 mm
35	φ 3.5 mm
50	φ 5.0 mm

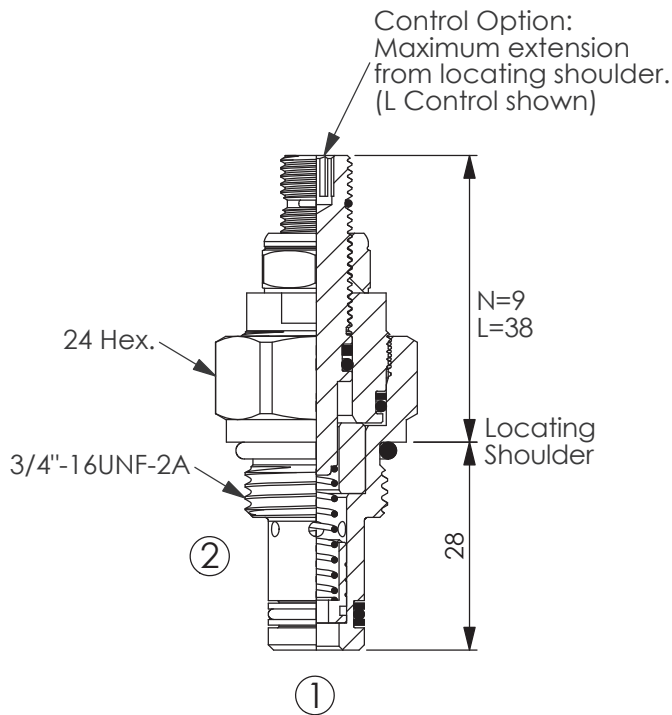
Z OPTIONS

Cracking Pressure (Port ①to②)

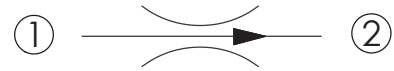
0.3 bar
1.0 bar
5.0 bar

FLOW CONTROL VALVE (Fixed Orifice, Pressure Compensated)

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



UNIT:mm

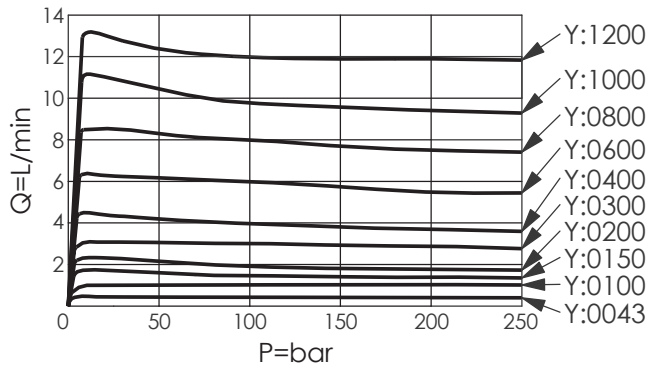


TECHNICAL DATA

Max. pressure:	240	bar
Rated Flow:	12	l/min
Cavity-Tooling:	08W-2	
Installation torque:	25-35	Nm
Weight:	0.07 (Z:N)	kg
	0.10 (Z:L)	kg

Accurate pressure compensated control requires that a 5.5 bar minimum pressure differential be maintained across the valve

Typical Performance



Y	FLOW SETTING
0043	0.43 LPM
0100	1 LPM
0150	1.5 LPM
0200	2 LPM
0300	3 LPM
0400	4 LPM
0600	6 LPM
0800	8 LPM
1000	10 LPM
1200	12 LPM

.Factory set flow ratings are within +/- 10% of the requested setting

X OPERATION

20 Standard Type

Z OPTION

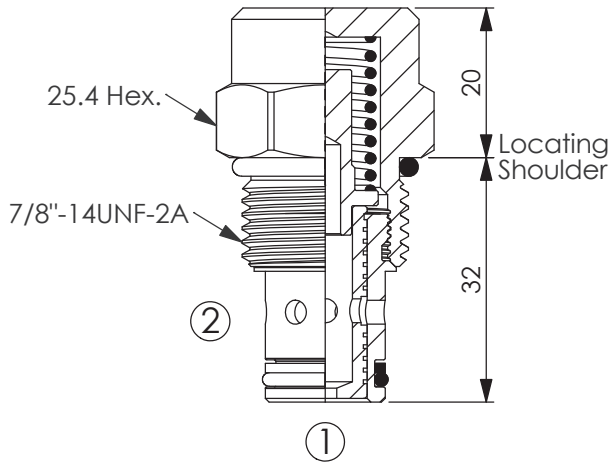
N Non-adjustable

L Leakproof hex. socket screw.
(Adjustment Ranges $\pm 10\%$)

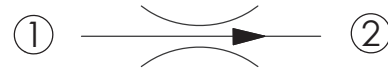


FLOW CONTROL VALVE (Fixed Orifice, Pressure Compensated)

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



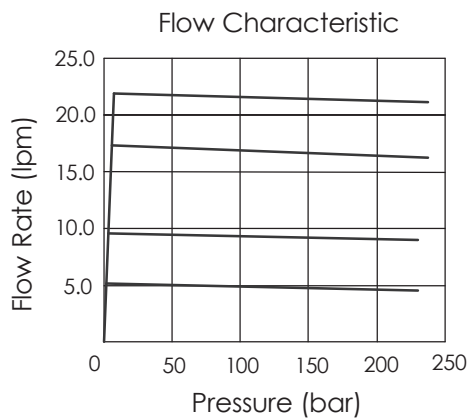
UNIT:mm



TECHNICAL DATA

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

Accurate pressure compensated control requires that a 6 bar minimum pressure differential be maintained across the valve



X

OPERATION

20

Standard Type

Y

FLOW SETTING

018

1.8 LPM

050

5.0 LPM

120

12.0 LPM

140

14.0 LPM

160

16.0 LPM

230

23.0 LPM

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

Z

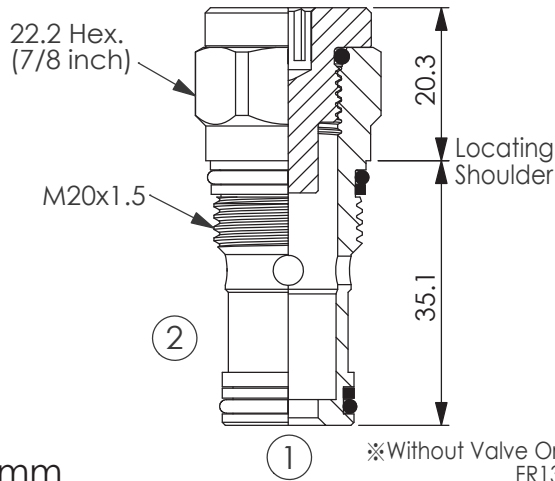
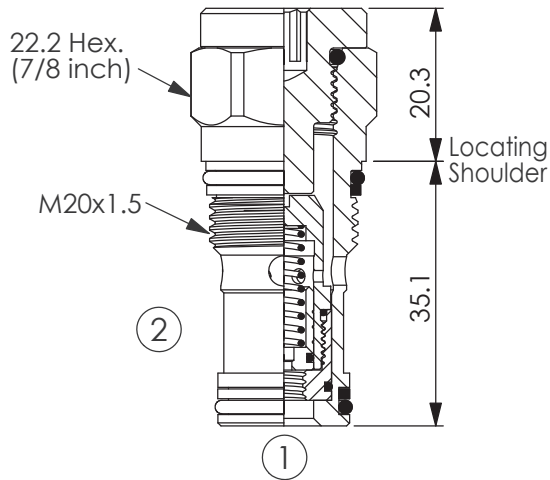
OPTION

N

Non-adjustable

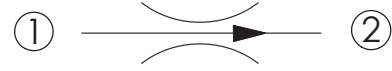
FLOW CONTROL VALVE (Fixed Orifice, Pressure Compensated)

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



UNIT:mm

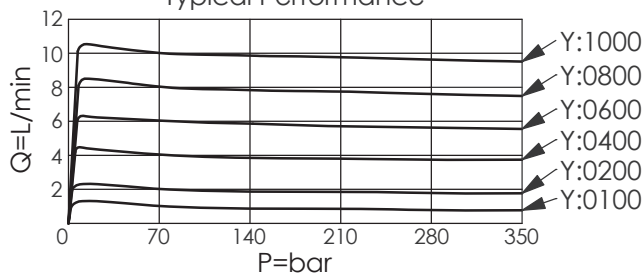
※Without Valve Order Code:
FR13A2F0000N



TECHNICAL DATA

Pressure min-max:	10-350	bar
Rated flow:	10	l/min
Cavity-Tooling:	13A-2	
Installation torque:	40-50	Nm
Weight:	0.10	kg

Typical Performance



Y	FLOW SETTING
0000	Without Valve
0050	0.5 LPM
0065	0.65 LPM
0080	0.8 LPM
0100	1.0 LPM
0150	1.5 LPM
0200	2.0 LPM
0400	4.0 LPM
0530	5.3 LPM
0600	6.0 LPM
0700	7.0 LPM
0800	8.0 LPM
1000	10.0 LPM

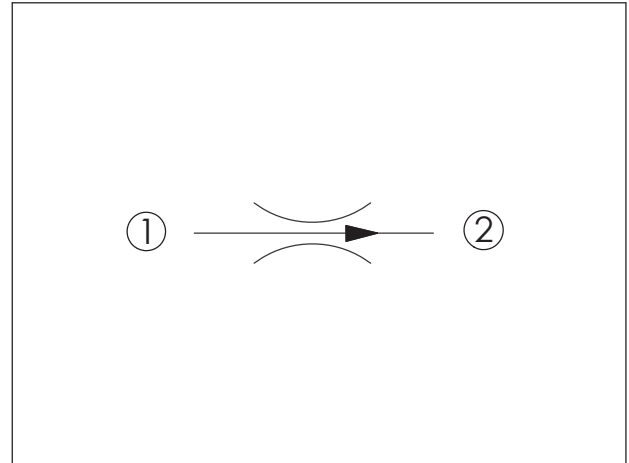
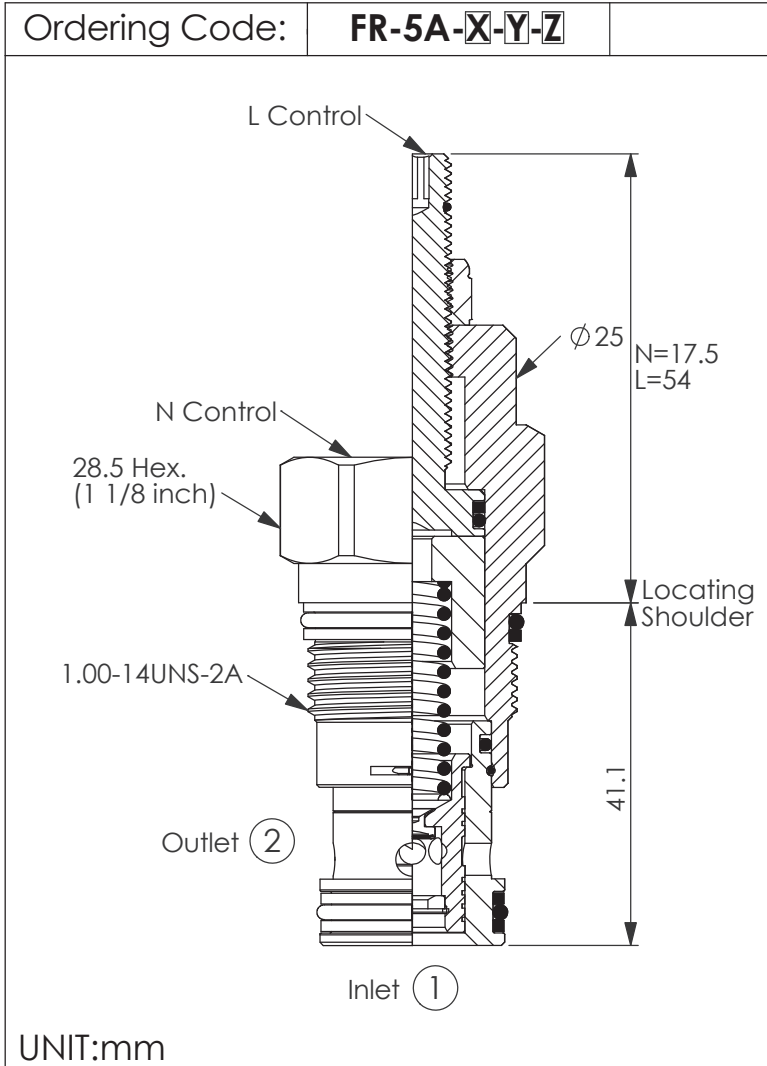
X OPERATION

2F Fixed Setting

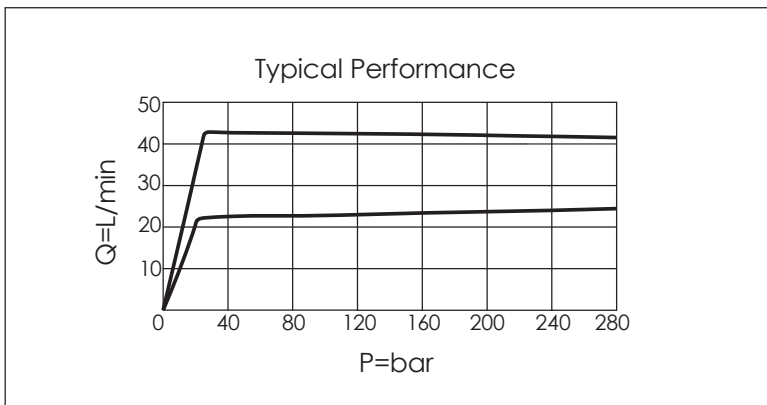
Z OPTIONS

N Non-adjustable

FLOW CONTROL VALVE (Fixed Orifice, Pressure Compensated)



TECHNICAL DATA		
Pressure min-max:	10-350	bar
Rated flow:	45	l/min
Cavity-Tooling:	5A-2	
Installation torque:	60-70	Nm
Weight:	0.20	kg



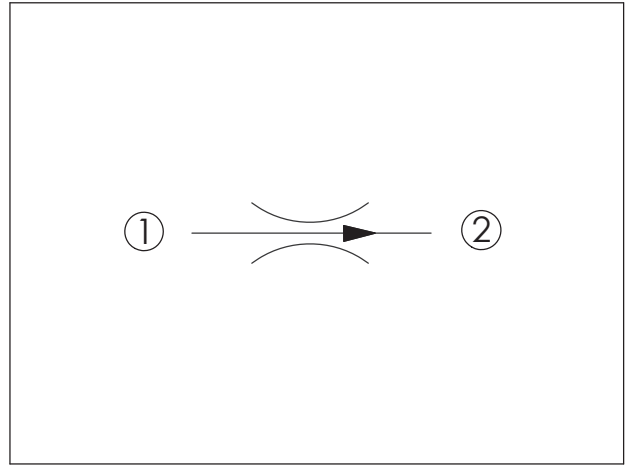
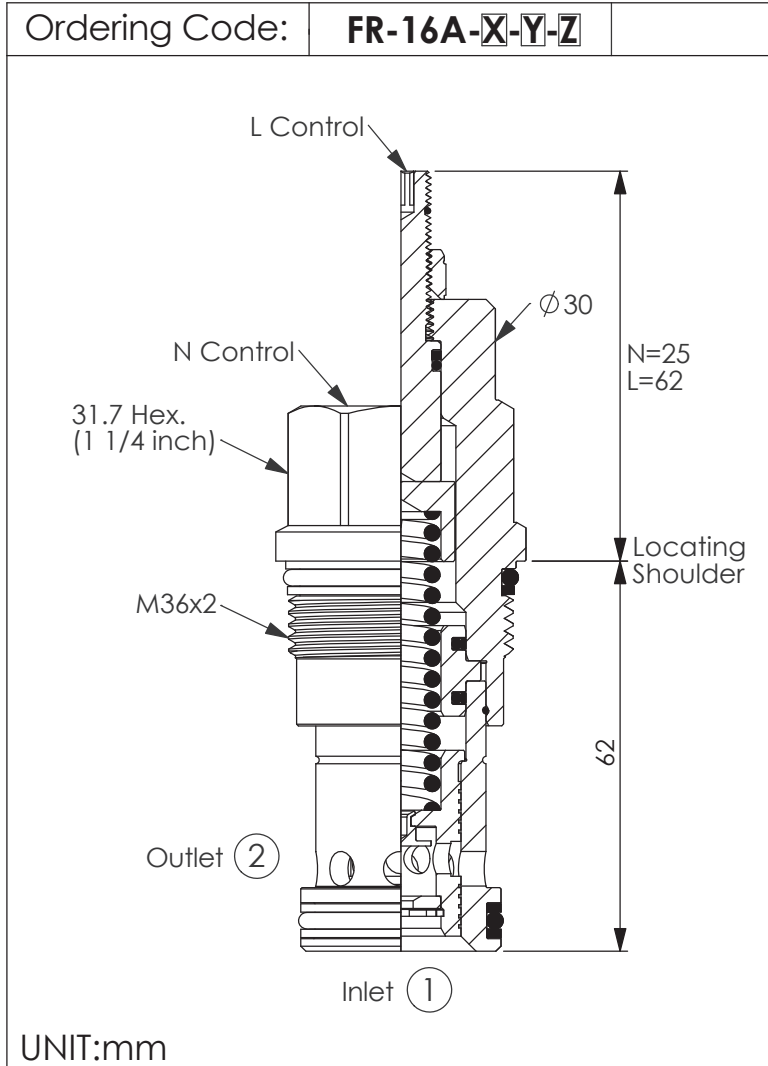
X	OPERATION	
2F	Fixed Setting	

Y	FLOW SETTING	
0800	8.0 LPM	
3000	30.0 LPM	

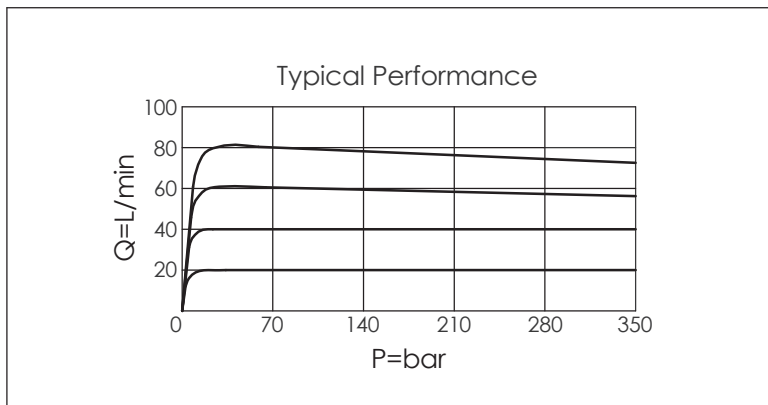
.Factory set flow ratings are within +/- 10% of the requested setting
.Customer must specify a flow rating

Z	OPTIONS	
N	Non-adjustable	
L	Leakproof hex. socket screw.	

FLOW CONTROL VALVE (Fixed Orifice, Pressure Compensated)



TECHNICAL DATA	
Pressure min-max:	10-350 bar
Rated flow:	95 l/min
Cavity-Tooling:	16A-2
Installation torque:	200-215 Nm
Weight:	0.47 (Z:N) kg

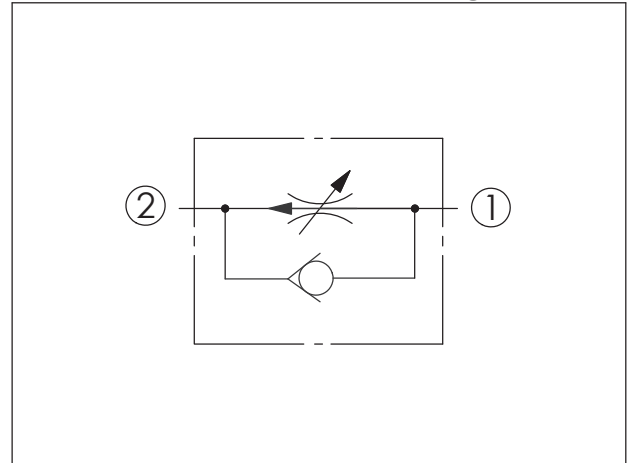
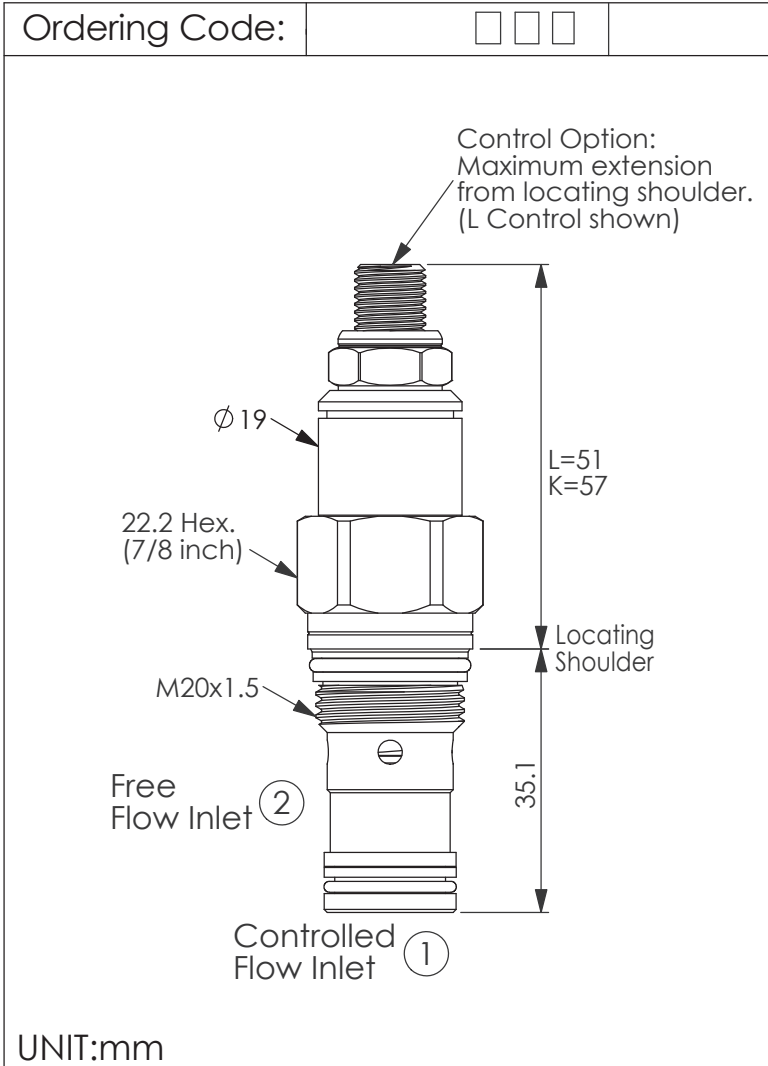


X	OPERATION	
2F	Fixed Setting	

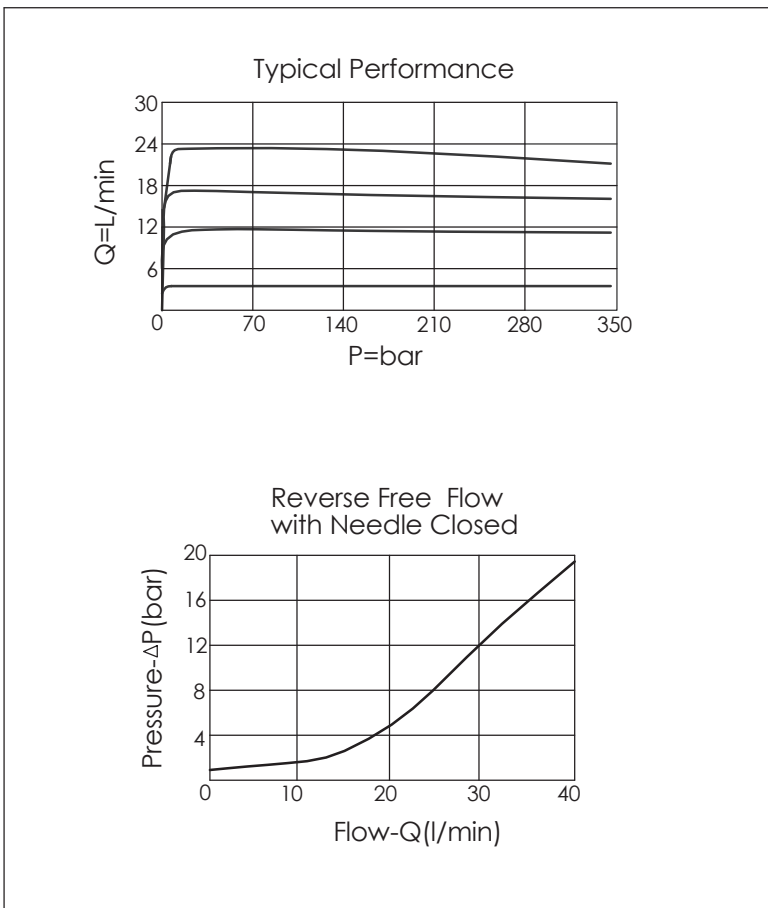
Y	FLOW SETTING	
0200	20.0 LPM	
<ul style="list-style-type: none"> Factory set flow ratings are within +/- 10% of the requested setting Customer must specify a flow rating 		

Z	OPTIONS	
N	Non-adjustable	
L	Leakproof hex. socket screw.	

FLOW CONTROL VALVE (Fully Adjustable Pressure Compensated Flow Control Valve with Reverse Flow Check and Sharp-Edge Orifice)



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.		

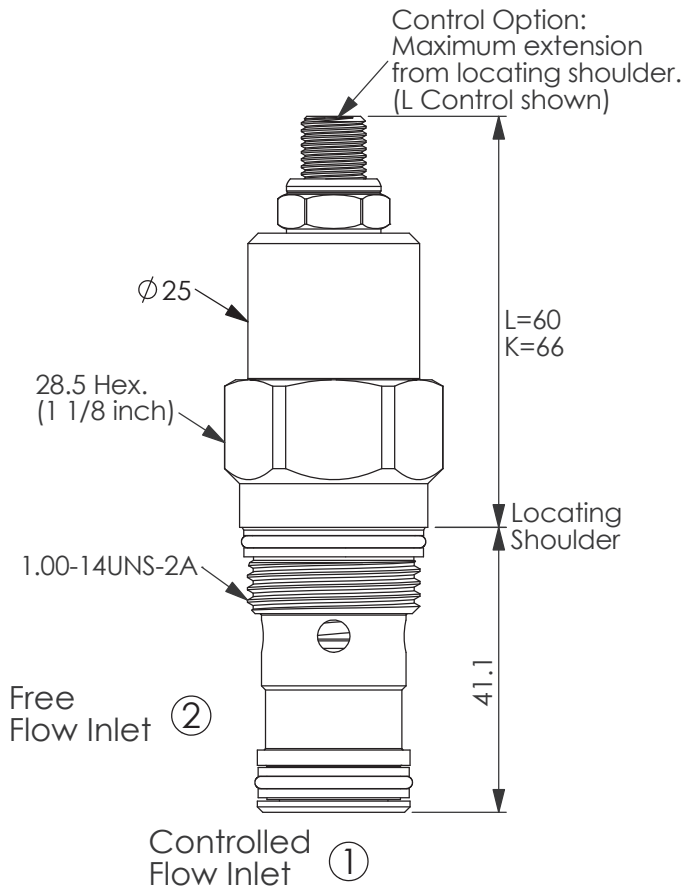


X	OPERATION	
20	Standard Type	
Y	FLOW SETTING	
A	0.4 to 23 LPM	
C	0.4 to 4 LPM	
Z	OPTIONS	
L	Leakproof hex. socket screw.	
K	Handknob with Lock Knob.	
T	Three-winged Handknob Kit.	

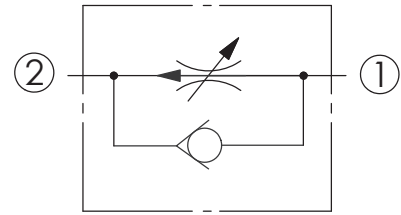
FLOW CONTROL VALVE

(Fully Adjustable Pressure Compensated Flow Control Valve with Reverse Flow Check and Sharp-Edge Orifice)

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



UNIT:mm



TECHNICAL DATA

Max. pressure: 350 bar

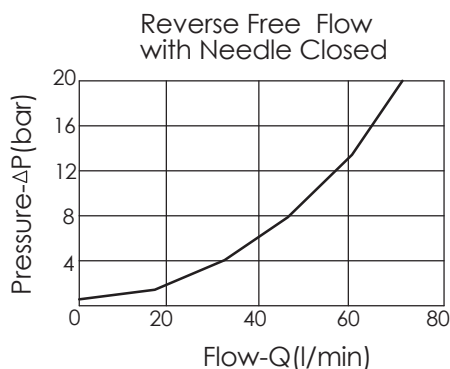
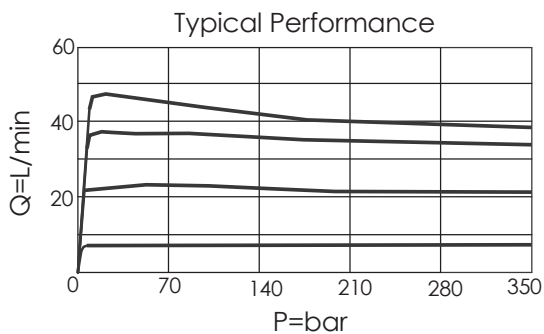
Rated flow: 45 l/min

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 FLOW SETTING

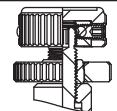
A 0.4 to 45 LPM

Z OPTIONS

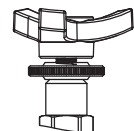
L Leakproof hex. socket screw.



K Handknob with Lock Knob.



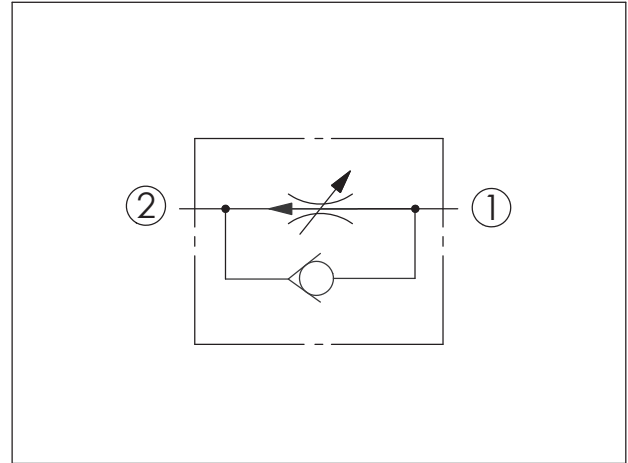
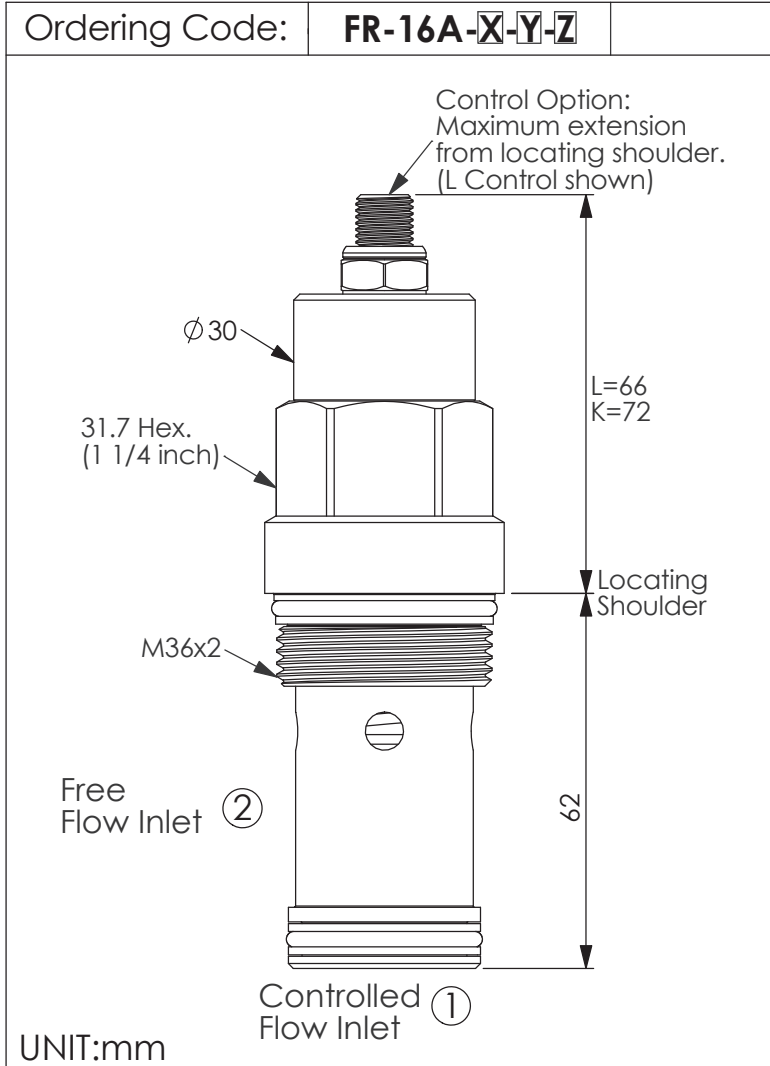
T Three-winged Handknob Kit.



LP Leakproof hex. socket screw. With stainless steel external metal components

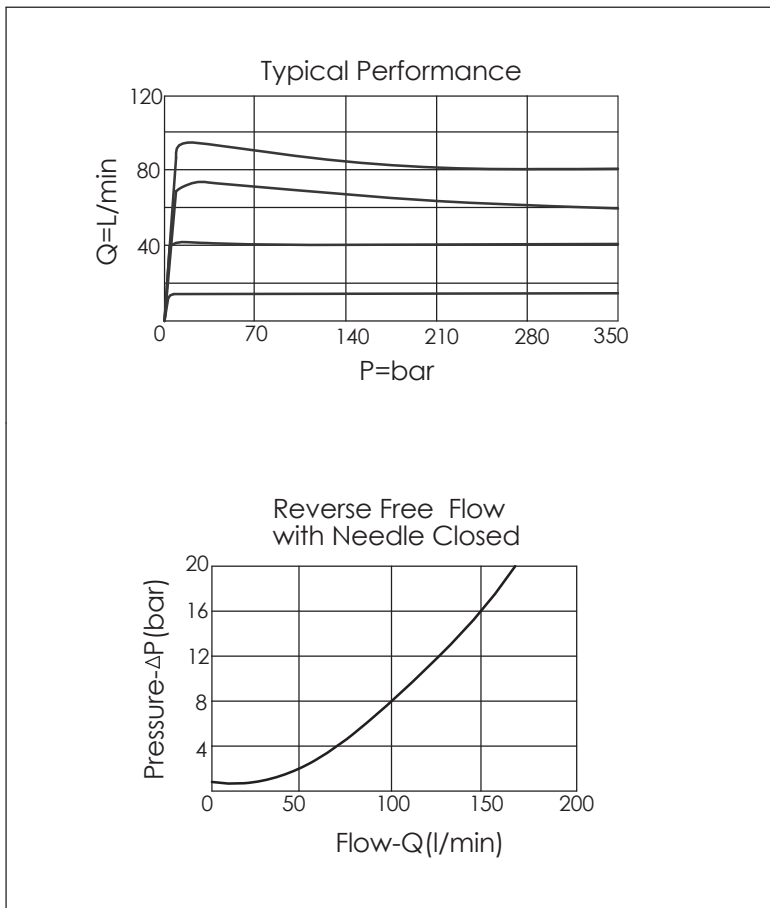


FLOW CONTROL VALVE (Fully Adjustable Pressure Compensated Flow Control Valve with Reverse Flow Check and Sharp-Edge Orifice)



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

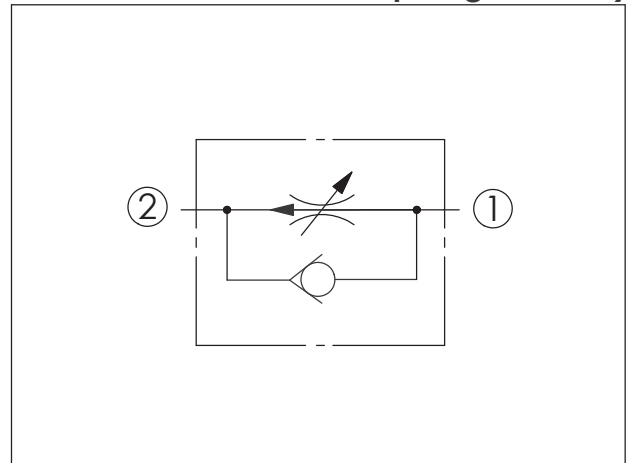
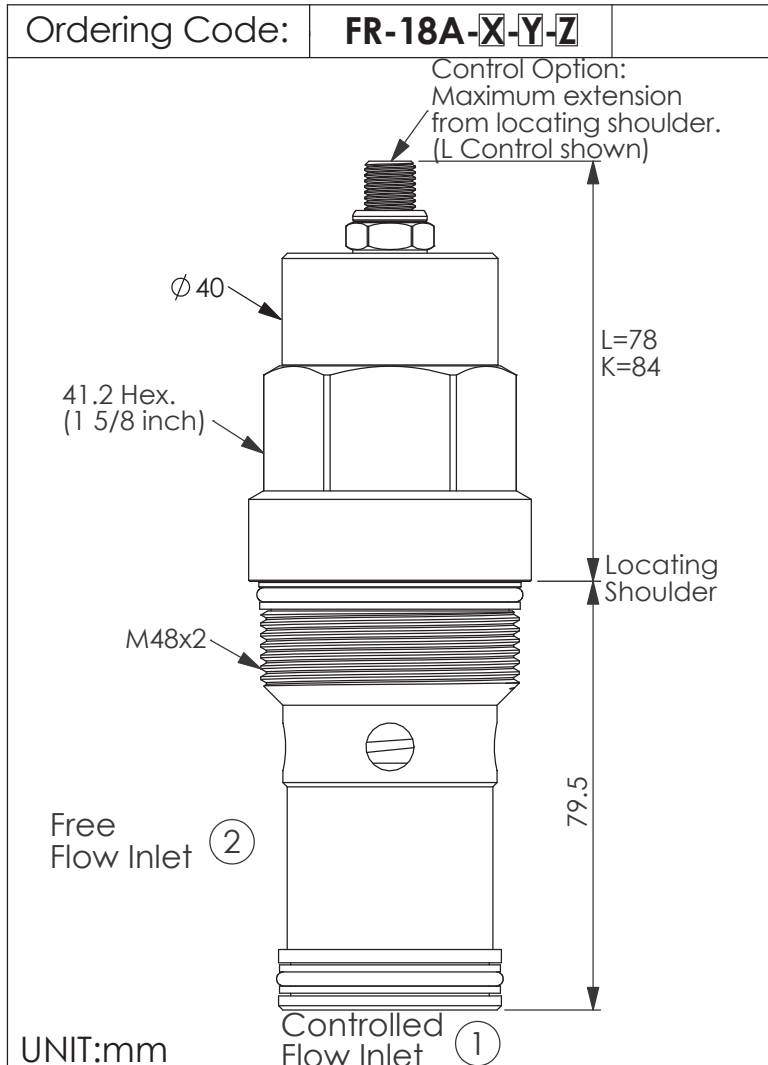
Accurate pressure compensated control requires that a 200 psi (14 bar) minimum pressure differential be maintained across the valve.



X	OPERATION	
20	Standard Type	
Y	FLOW SETTING	
A	0.8 to 95 LPM	
Z	OPTIONS	
L	Leakproof hex. socket screw.	
K	Handknob with Lock Knob.	
T	Three-winged Handknob Kit.	
LP	Leakproof hex. socket screw. With stainless steel external metal components	

FLOW CONTROL VALVE

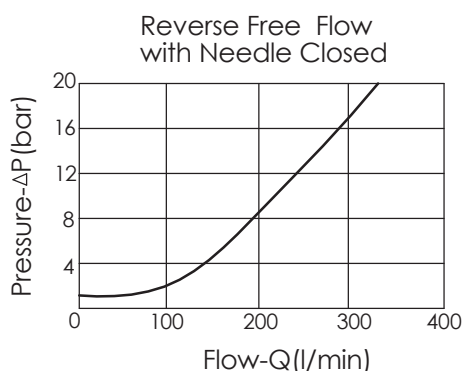
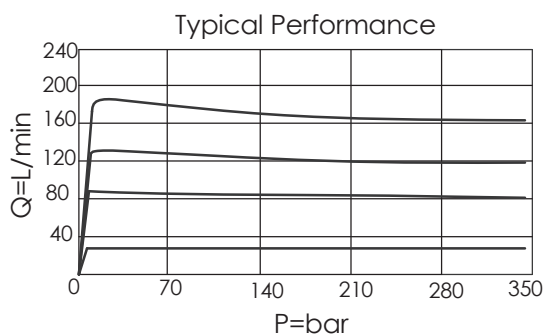
(Fully Adjustable Pressure Compensated Flow Control Valve with Reverse Flow Check and Sharp-Edge Orifice)



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.



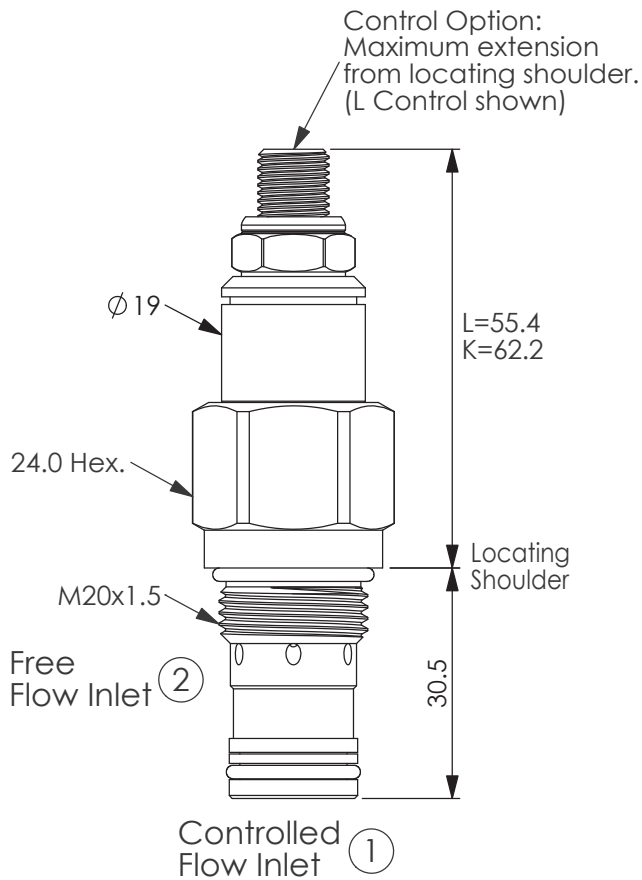
X	OPERATION	
20	Standard Type	

Y	FLOW SETTING	
A	1.0 to 200 LPM	

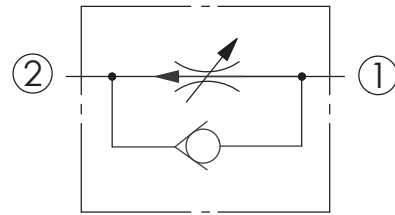
Z	OPTIONS	
L	Leakproof hex. socket screw.	
K	Handknob with Lock Knob.	
T	Three-winged Handknob Kit.	

FLOW CONTROL VALVE (Fully Adjustable Pressure Compensated Flow Control Valve with Reverse Flow Check and Sharp-Edge Orifice)

Ordering Code: **FR-20MC-X-Y-Z**



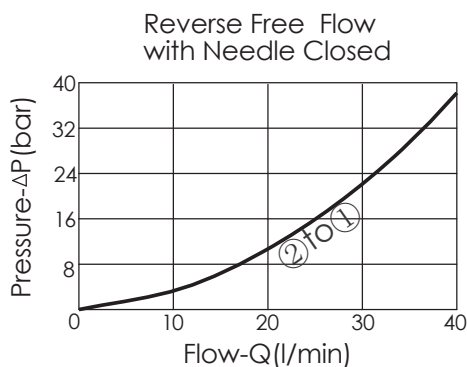
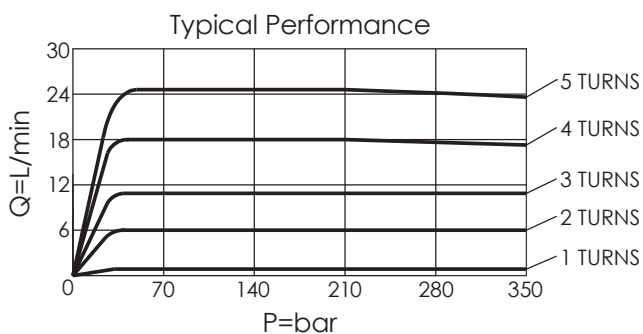
UNIT:mm



TECHNICAL DATA

Max. pressure:	350	bar
Rated flow:	23	l/min
Cavity-Tooling:	20MC-2	
Installation torque:	40-50	Nm
Weight:	0.13	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

FLOW SETTING

A

0.4 to 23 LPM

C

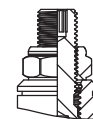
0.4 to 4 LPM

Z

OPTIONS

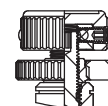
L

Leakproof hex. socket screw.



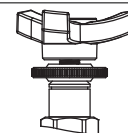
K

Handknob with Lock Knob.



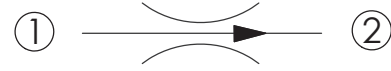
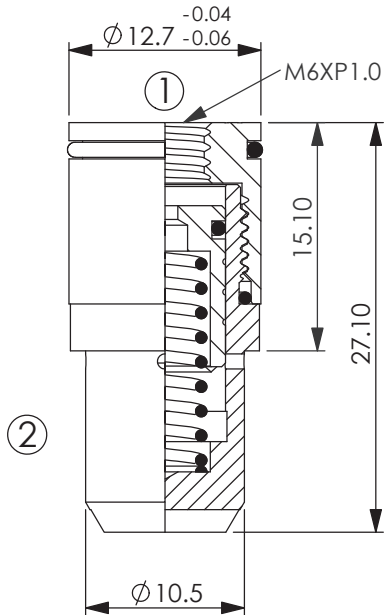
T

Three-winged Handknob Kit.



FLOW CONTROL VALVE (Hole Pressure Compensated)

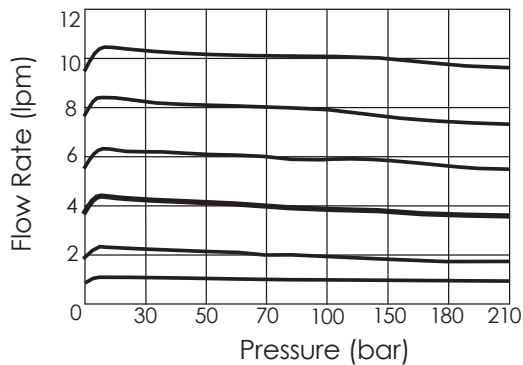
Ordering Code: **FR-04H-E-Y-Z**



TECHNICAL DATA

Max. pressure:	210	bar
Rated Flow:	20	l/min
Weight:	0.015	kg

UNIT:mm



Y FLOW SETTING

Y	FLOW SETTING
0045	0.45 LPM
0065	0.65 LPM
0080	0.8 LPM
0350	3.5 LPM
0400	4.0 LPM
0600	6.0 LPM
0800	8.0 LPM
1000	10.0 LPM
1400	14.0 LPM
1800	18.0 LPM
2000	20.0 LPM

Z

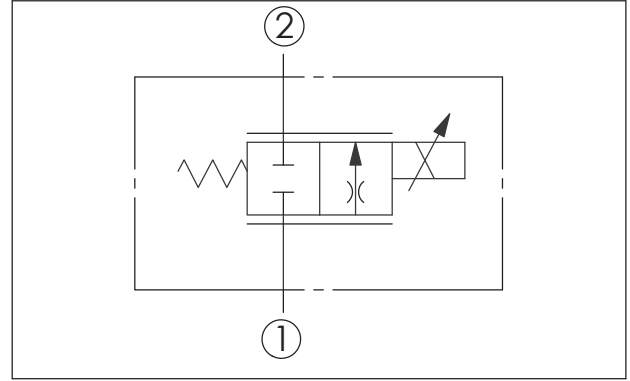
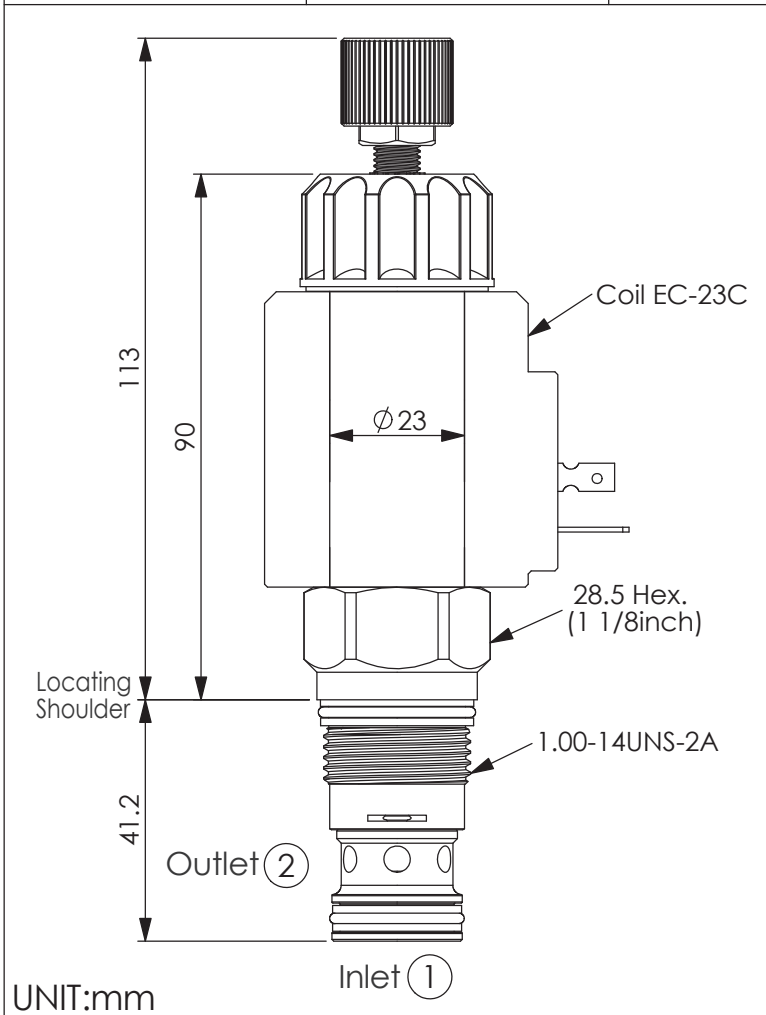
OPERATION

A

Standard Type

FLOW CONTROL VALVE (Electro-Proportional Flow Control Valve, Normally Closed Throttle)

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



TECHNICAL DATA

Max. Operating pressure: 350 bar

Rated flow: 80 l/min

Cavity-Tooling: 5A-2

Installation torque: 60-70 Nm

Linearity (with dither) <2%

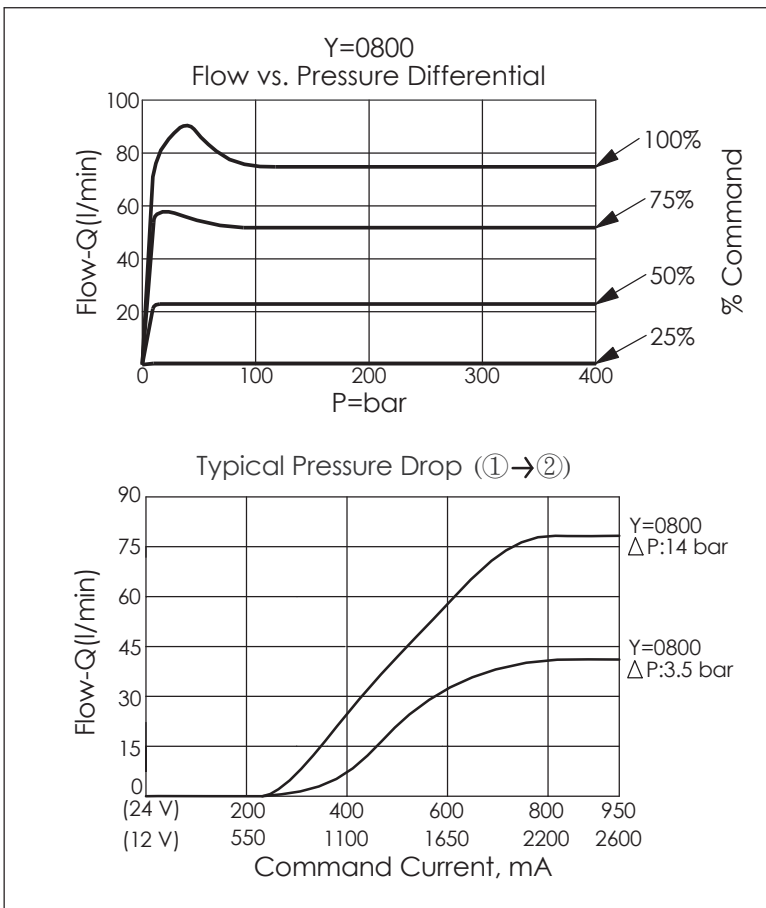
Repeatability (with dither) <2%

Hysteresis (with dither) <4%

Hysteresis with DC input <8%

Deadband, nominal (as a percentage of input) 25%

Weight:(with Coil) 0.71 kg
(without Coil) 0.36 kg



X	OPERATION	
2G	2 Ports · 30 Watt. Coil ϕ 23 mm tube	

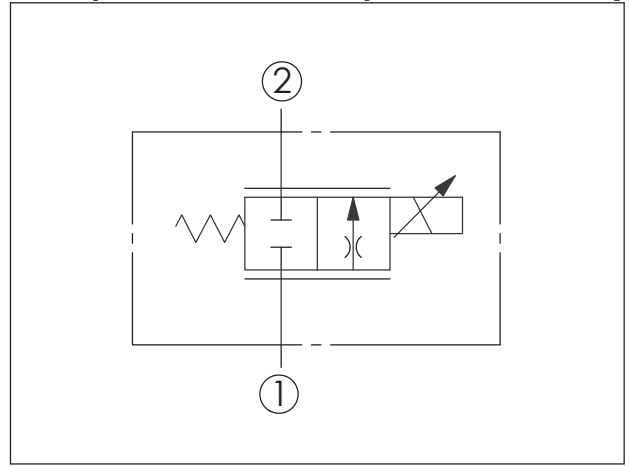
Y	FLOW	
	NOMINAL CAPACITY	
0800	80 LPM	

Z	OPTIONS	
N	Non-adjustable	
M	Manual Override	
P	Push Style Manual Override	

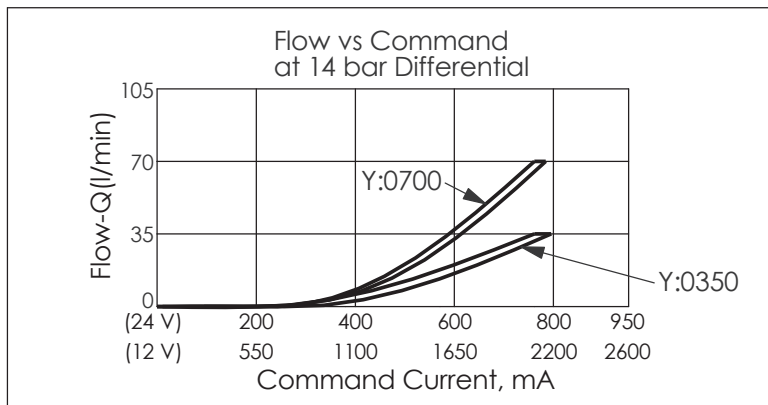
FLOW CONTROL VALVE (Electro-Proportional, Normally Closed Throttle)

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

UNIT:mm



TECHNICAL DATA		
Max.Operating pressure:	350	bar
Rated flow:	70	l/min
Cavity-Tooling:	17E-2	
Installation torque:	45-55	Nm
Weight:(with Coil)	0.70	kg
(without Coil)	0.35	kg



X	OPERATION	
2G	2 Ports	30 Watt. Coil

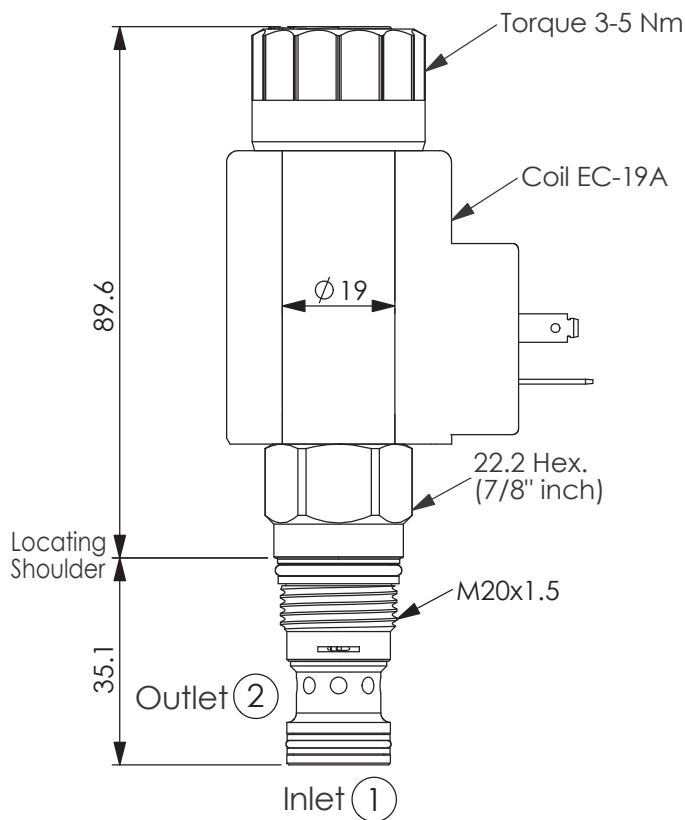
NOTE:Coil must be ordered separately. Use 12V DC or 24V DC (Series EC-23C) coils only.

Y	FLOW	
	NOMINAL CAPACITY	
0350	35 LPM	
0700	70 LPM	

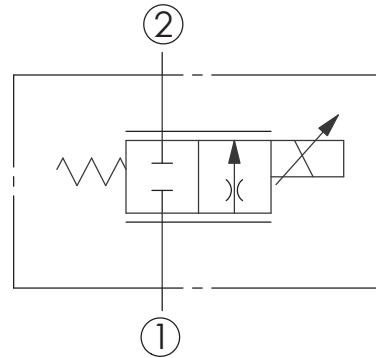
Z	OPTIONS	
N	Non-adjustable	
M	Manual Override (Standard)	
P	Push Style Manual Override	

FLOW CONTROL VALVE (Electro-Proportional Flow Control Valve, Normally Closed Throttle)

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



UNIT:mm



TECHNICAL DATA

Max.Operating pressure: 350 bar

Rated flow: 40 l/min

Cavity-Tooling: 13A-2

Installation torque: 40-50 Nm

Linearity (with dither) <2%

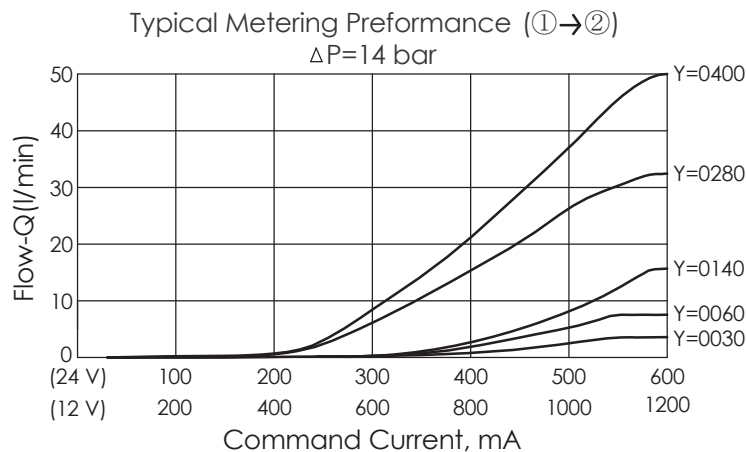
Repeatability (with dither) <2%

Hysteresis (with dither) <4%

Hysteresis with DC input <8%

Deadband, nominal (as a percentage of input) 25%

Weight:(with Coil) 0.53 kg
(without Coil) 0.28 kg



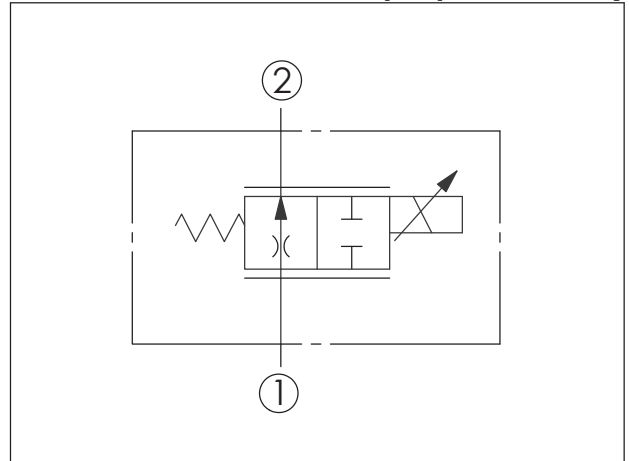
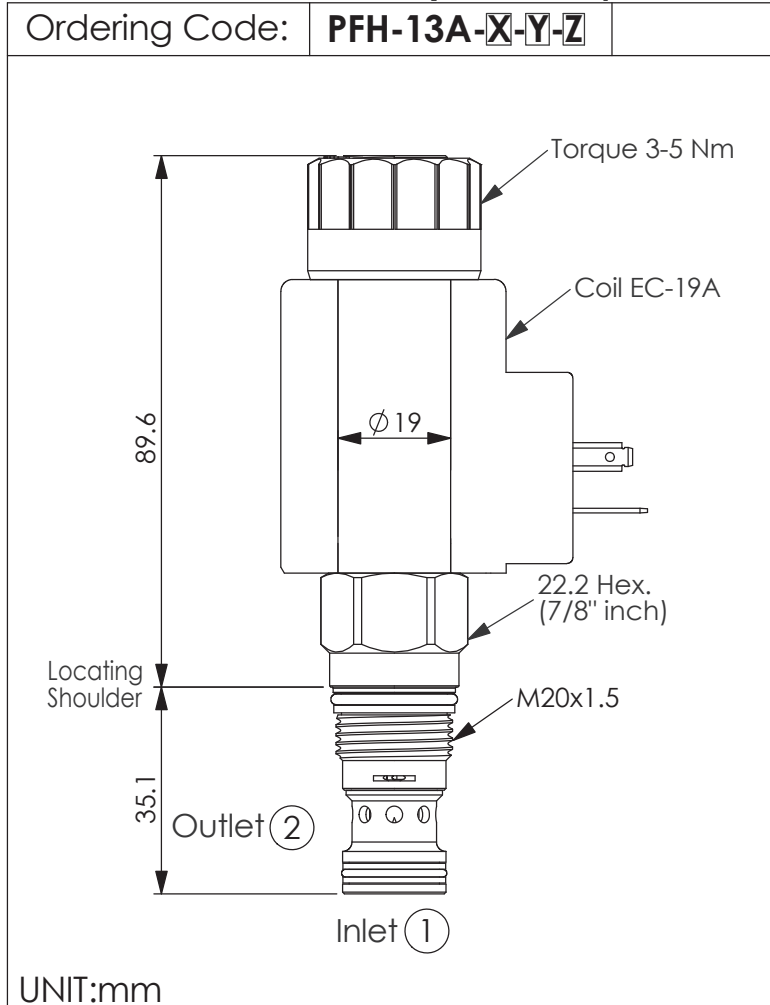
If you need more information
Please contact our sales department

Y	FLOW	
	NOMINAL CAPACITY	
0030	0.4~3 LPM	
0060	0.4~6 LPM	
0140	0.6~14 LPM	
0280	0.8~28 LPM (Standard)	
0400	1~40 LPM	

X	OPERATION	
2D	2 Ports · 22 Watt. Coil Ø 19 mm tube	

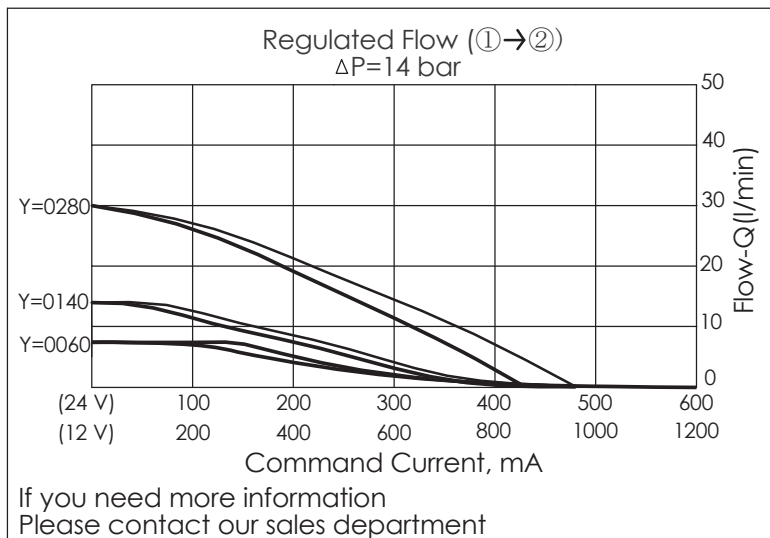
Z	OPTIONS	
N	Non-adjustable	
M	Manual Override	
P	Push Style Manual Override	

FLOW CONTROL VALVE (Electro-Proportional Flow Control Valve, Normally Open Throttle)



TECHNICAL DATA

Max. Operating pressure:	350	bar
Rated flow:	28	l/min
Cavity-Tooling:	13A-2	
Installation torque:	40-50	Nm
Linearity (with dither)	<2%	
Repeatibility (with dither)	<2%	
Hysteresis (with dither)	<4%	
Hysteresis with DC input	<8%	
Deadband, nominal (as a percentage of input)	25%	
Weight:(with Coil)	0.53	kg
(without Coil)	0.30	kg

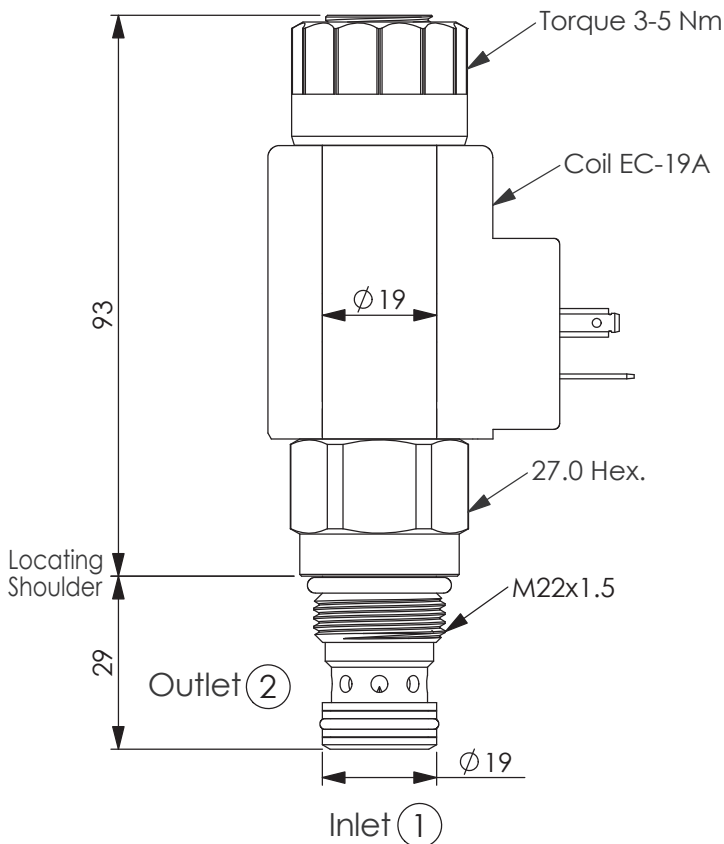


Y	FLOW	
	NOMINAL CAPACITY	
0060	0.4~6 LPM	
0140	0.6~14 LPM	
0280	0.8~28 LPM (Standard)	

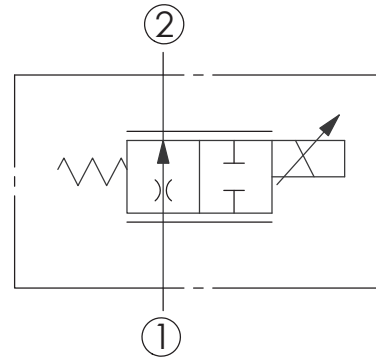
X	OPERATION	
2D	2 Ports · 22 Watt. Coil Ø 19 mm tube	

Z	OPTIONS	
N	Non-adjustable	
P	Push Style Manual Override	

Ordering Code: **PFH-22M-X-Y-Z**



UNIT:mm



TECHNICAL DATA

Max.Operating pressure: 350 bar

Rated flow: 28 l/min

Cavity-Tooling: 22M-2

Installation torque: 60-70 Nm

Linearity (with dither) <2%

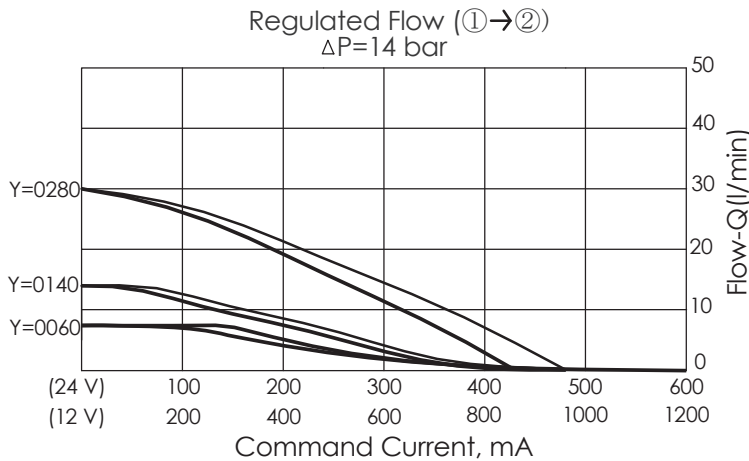
Repeatability (with dither) <2%

Hysteresis (with dither) <4%

Hysteresis with DC input <8%

Deadband, nominal (as a percentage of input) 25%

Weight:(with Coil) 0.73 kg
(without Coil) 0.50 kg



If you need more information
Please contact our sales department

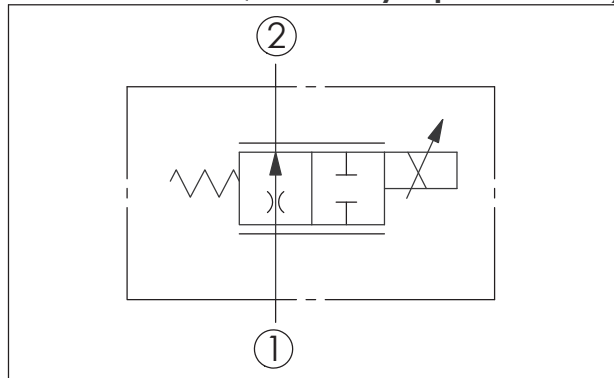
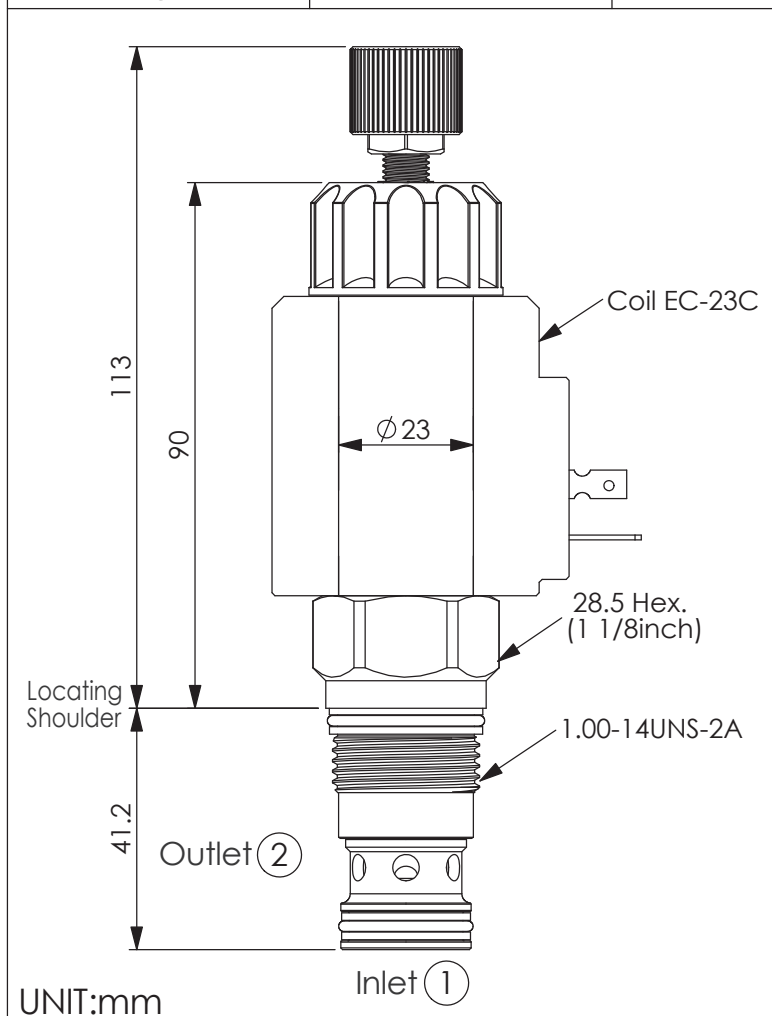
Y	FLOW	
	NOMINAL CAPACITY	
0060	0.4~6 LPM	
0140	0.6~14 LPM	
0280	0.8~28 LPM (Standard)	

X	OPERATION	
2D	2 Ports · 22 Watt. Coil Ø 19 mm tube	

Z	OPTIONS	
N	Non-adjustable	
P	Push Style Manual Override	

FLOW CONTROL VALVE (Electro-Proportional Flow Control Valve, Normally Open Throttle)

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



TECHNICAL DATA

Max. Operating pressure: 350 bar

Rated flow: 56 l/min

Cavity-Tooling: 5A-2

Installation torque: 60-70 Nm

Linearity (with dither) <2%

Repeatibility (with dither) <2%

Hysteresis (with dither) <4%


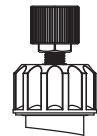

Hysteresis with DC input <8%

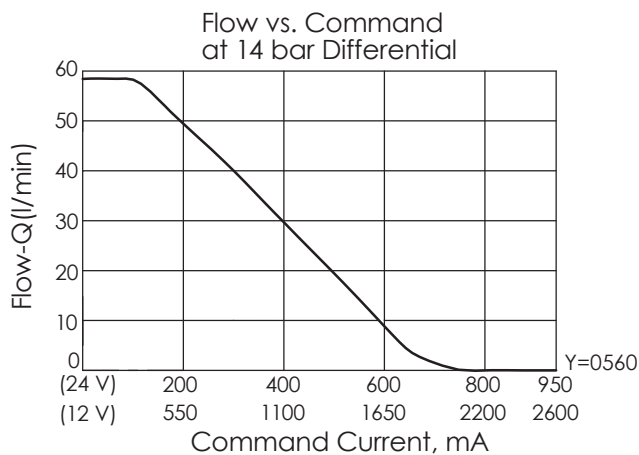
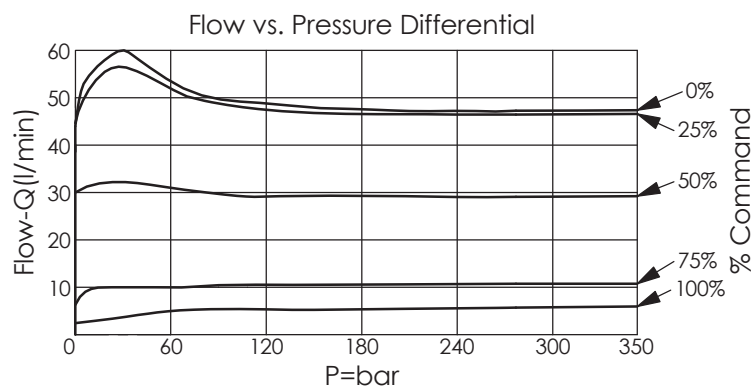
Deadband, nominal (as a percentage of input) 25%

Weight:(with Coil) 0.73 kg
(without Coil) 0.38 kg

X	OPERATION	
2G	2 Ports - 30 Watt. Coil	
	$\phi 23$ mm tube	

Y	FLOW	
	NOMINAL CAPACITY	
0560	56 LPM	

Z	OPTIONS	
N	Non-adjustable	
M	Manual Override (Standard)	
P	Push Style Manual Override	

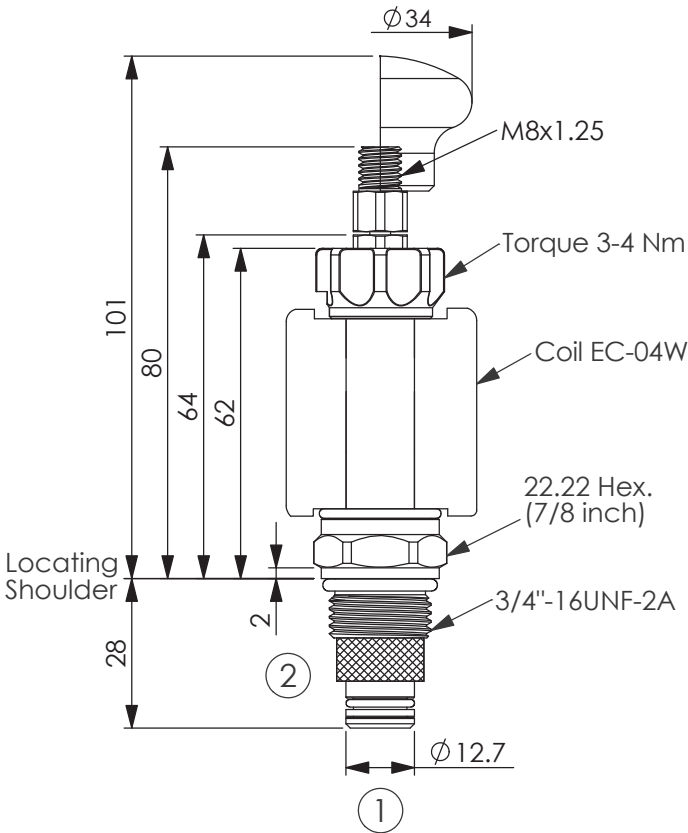
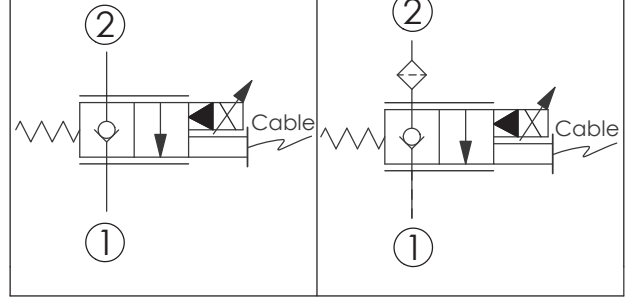


FLOW CONTROL VALVE (Electro-Proportional, Normally Closed With Cable)

Ordering Code: **PEP-08W-2A-X-Y-Z**

X:01

X:07



UNIT:mm

TECHNICAL DATA

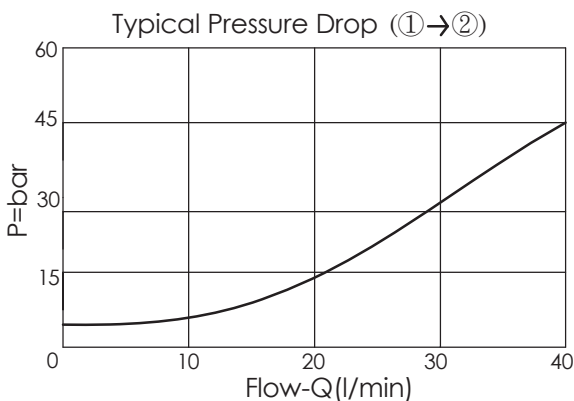
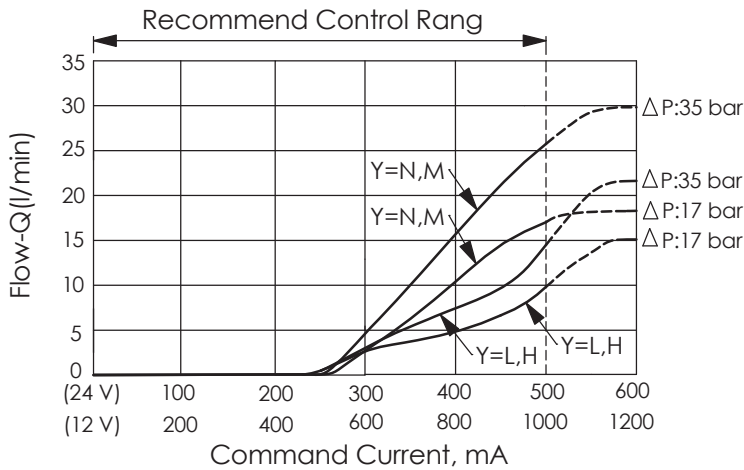
Max.Operating pressure:	250	bar
Rated flow:	22	l/min
Cavity-Tooling:	08W-2	
Installation torque:	25-35	Nm
Weight:(with Coil)	0.37	kg
(without Coil)	0.15	kg

Coils must be ordered separately

Internal Leakage: 0.15 cc/minute
(5 drops/minute) max. at 250 bar

Contionous Duty Coils:Current(A)

Voltage(V)	Cold Coil	Hot Coil
12	1.66	1.06
24	0.88	0.53



X

STRUCTURE

01

Normally-Closed
No Reverse Flow Energized

07

Normally-Closed With Filter
No Reverse Flow Energized

Y

OPTIONS

N

Non-adjustable



M

Manual Override



L

Pull Style
(Cable Operated)



H

Pull Style
(Hand Operated)



Z

FLOW

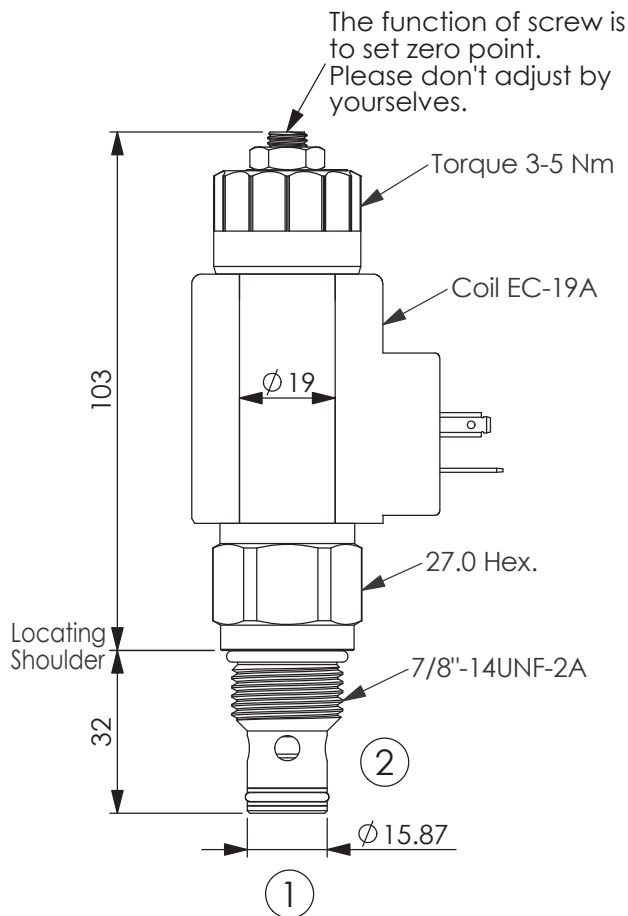
NOMINAL CAPACITY

0220

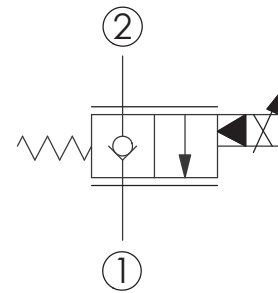
0 - 22 LPM

FLOW CONTROL VALVE (Electro-Proportional, Normally Closed)

Ordering Code: **PEP-10W-X-Y-N-Z**



UNIT:mm



TECHNICAL DATA

Max.Operating pressure: 260 bar

Rated flow: 55 l/min
(Refer To Performance Chart)

Cavity-Tooling: 10W-2

Installation torque: 45-50 Nm

Weight:(with Coil) 0.30 kg
(without Coil) 0.54 kg

Coils must be ordered separately

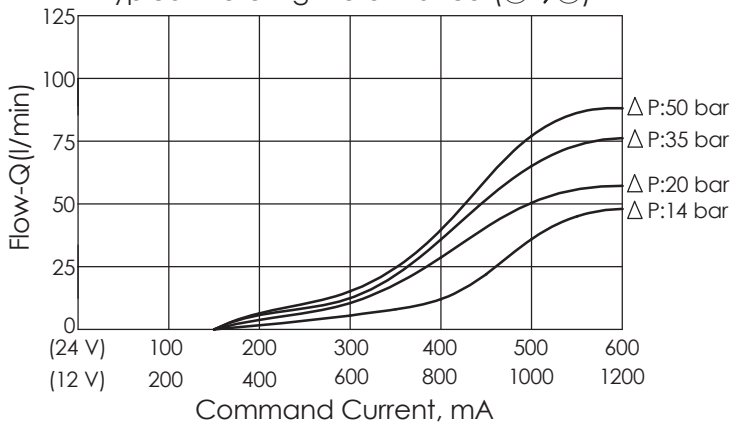
(6 drops/minute) max.at 260 bar

Contionous Duty Coils:Current(A)

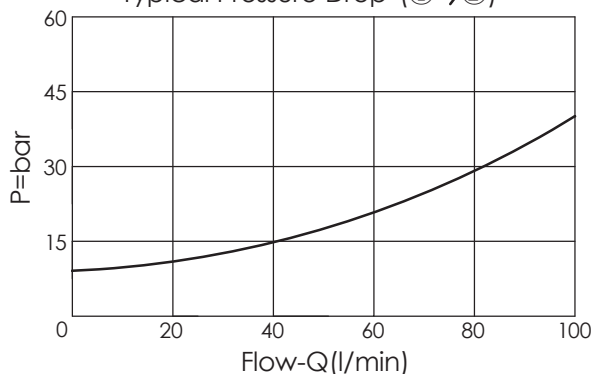
Voltage(V)	Cold Coil	Hot Coil
12	1.8	0.8
24	0.9	0.4

Performance Chart

Typical Metering Perfomance (②→①)



Typical Pressure Drop (①→②)



X	STRUCTURE
2D	2 Ports · 22 Watt. Coil ∅ 19 mm tube

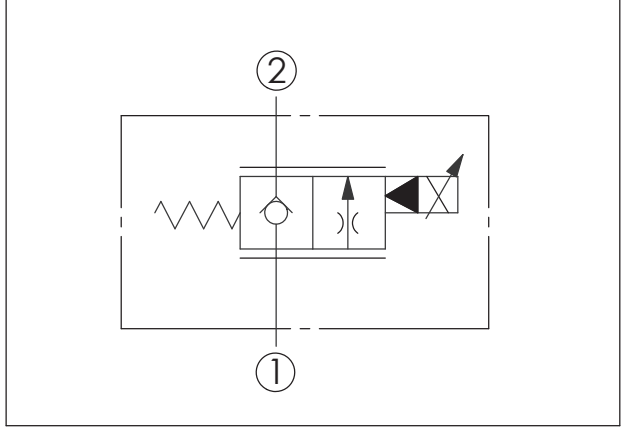
Y	OPERATION
01	Normally-Closed No Reverse Flow Energized

Z	FLOW
	NOMINAL CAPACITY
0550	0 - 55 LPM

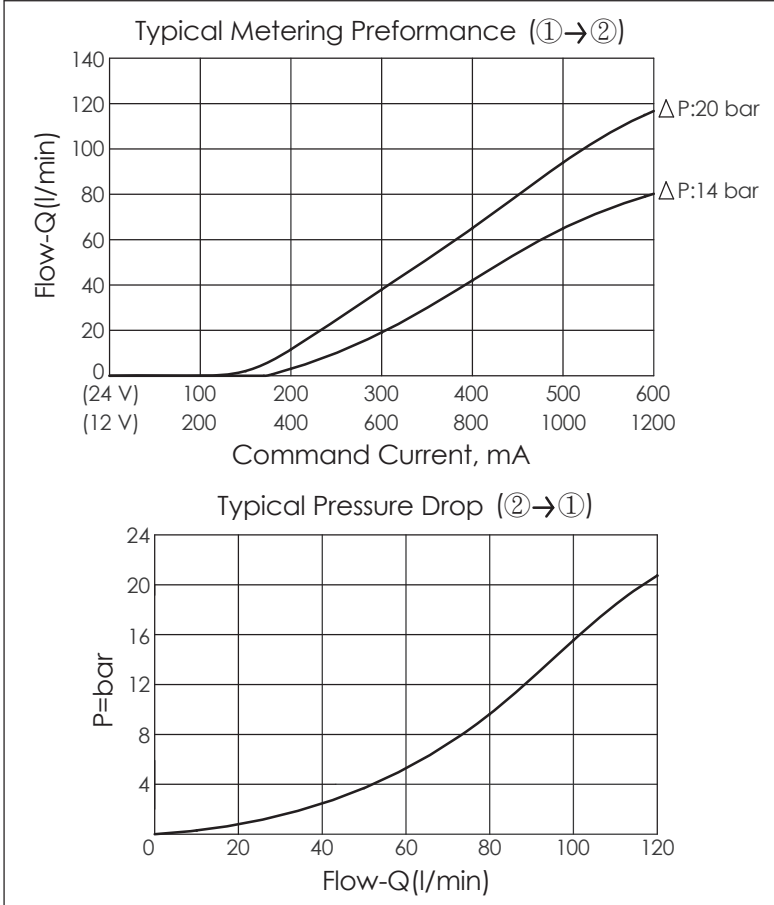
FLOW CONTROL VALVE (Electro-Proportional, Normally Closed, Fast-acting)

Ordering Code: **PEV-5A-2D-X-Y-Z**

UNIT:mm



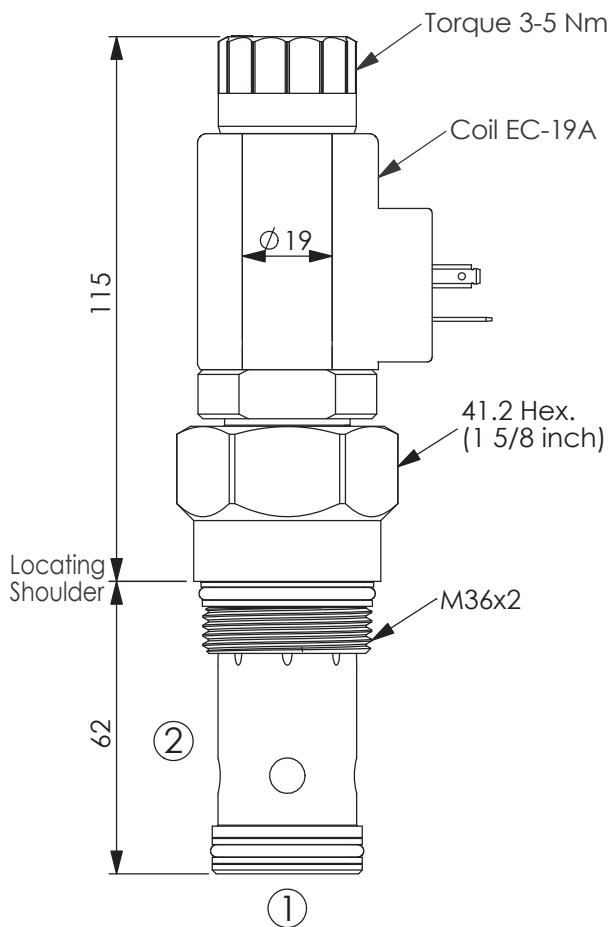
TECHNICAL DATA	
Max.Operating pressure:	350 bar
Rated flow:	80 l/min
Cavity-Tooling:	5A-2
Installation torque:	60-70 Nm
Weight:(with Coil)	0.64 kg
(without Coil)	0.40 kg
Fluids-Temperatures:	-40 to 120 °C
Leakage at ΔP of 140 bar 40cc/minute maximum	
Typical hysteresis less than 4% of rated current at 10 bar pressure drop - Pulse Width Modulated(PWM)	
Recommended PWM frequency 60-150 HZ, application dependent, 140 HZ typical	
Coils must be ordered separately	
2 Ports · 22 Watt. Coil φ 19 mm tube	



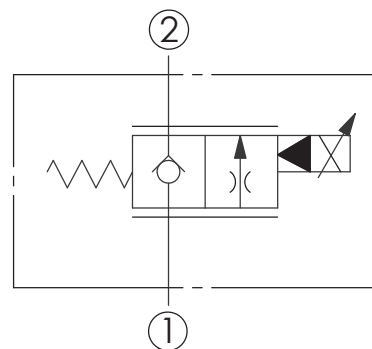
X	OPTIONS	
09	Normally-Closed, No Reverse Flow Energized, Nose-in, Side-out Operation	
Y	OPTIONS	
N	Non-adjustable	
P	Push Style Manual Override	
Z	FLOW	
	NOMINAL CAPACITY	
0800	0-80 LPM	

FLOW CONTROL VALVE (Electro-Proportional, Normally Closed, Fast-acting)

Ordering Code: **PEV-16A-2D-X-Y-Z**



UNIT:mm



TECHNICAL DATA

Max.Operating pressure: 350 bar

Rated flow: 240 l/min

Cavity-Tooling: 16A-2

Installation torque: 200-215 Nm

Weight:(with Coil) 1.05 kg
(without Coil) 0.81 kg

Fluids-Temperatures: -40 to 120 °C

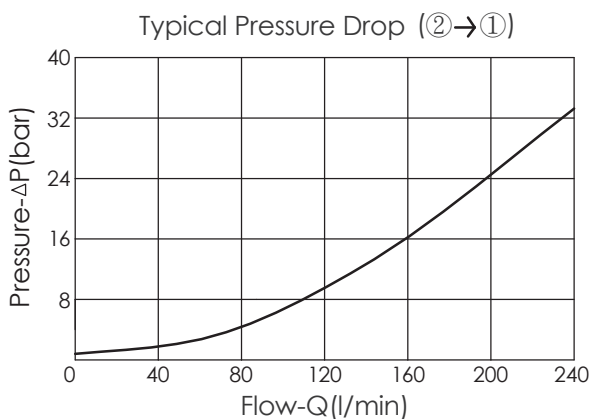
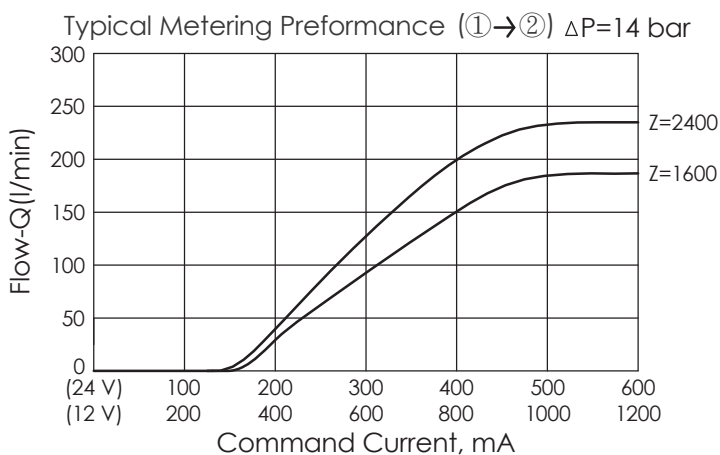
Leakage at ΔP of 140 bar
40cc/minute maximum

Typical hysteresis less than 4% of rated current at 10 bar pressure drop - Pulse Width Modulated(PWM)

Recommended PWM frequency 60-150 HZ, application dependent, 140 HZ typical

Coils must be ordered separately

2 Ports · 22 Watt. Coil ϕ 19 mm tube



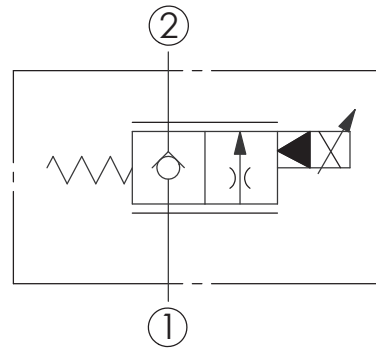
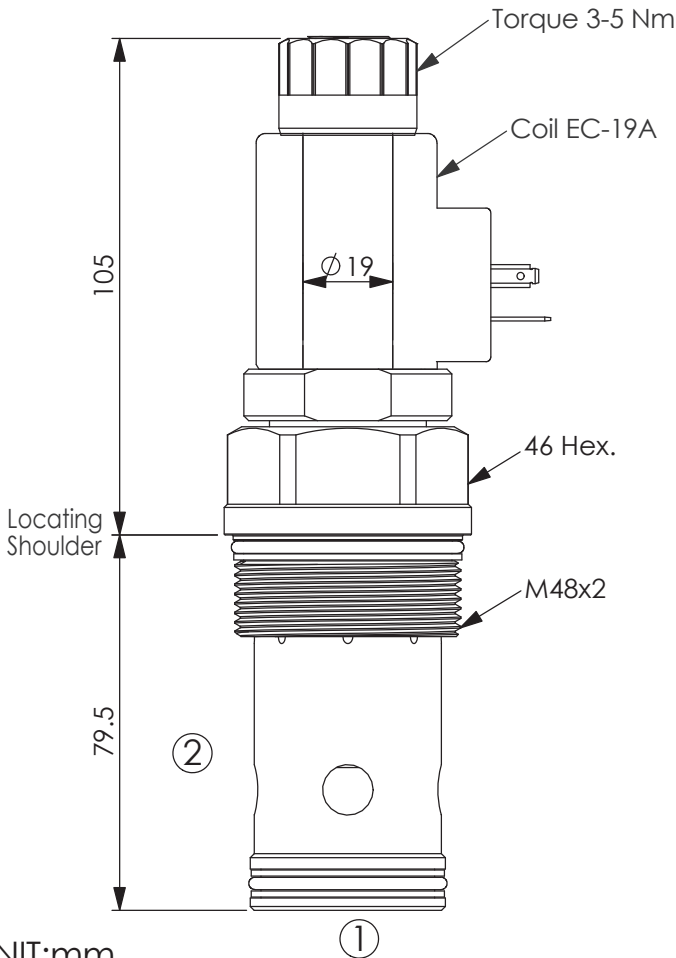
X	OPTIONS	
09	Normally-Closed, No Reverse Flow Energized, Nose-in, Side-out Operation	

Y	OPTIONS	
N	Non-adjustable	
P	Push Style Manual Override	

Z	FLOW NOMINAL CAPACITY	
1600	0-160 LPM	
2400	0-240 LPM	

FLOW CONTROL VALVE (Electro-Proportional, Normally Closed, Fast-acting)



Ordering Code: **PEV-18A-2D-X-Y-Z**



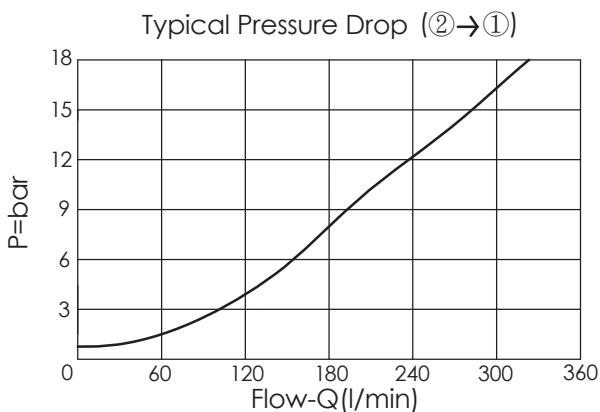
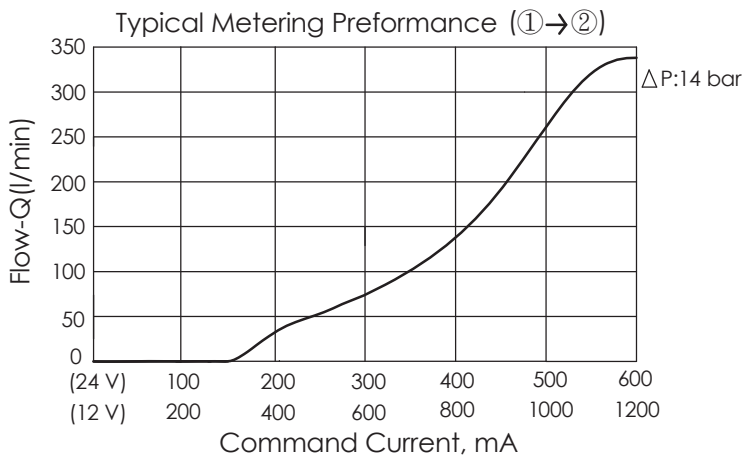
TECHNICAL DATA

Max.Operating pressure:	350	bar
Rated flow:	320	l/min
Cavity-Tooling:	18A-2	
Installation torque:	200-215	Nm
Weight:(with Coil)	1.49	kg
(without Coil)	1.25	kg
Fluids-Temperatures:	-40 to 120	°C
Leakage at ΔP of 140 bar	50cc/minute maximum	
Typical hysteresis less than 4% of rated current at 10 bar pressure drop - Pulse Width Modulated(PWM)	Recommended PWM frequency 60-150 HZ, application dependent, 140 HZ typical	
Coils must be ordered separately		
2 Ports · 22 Watt. Coil ϕ 19 mm tube		

X	OPTIONS
09	Normally-Closed, No Reverse Flow Energized, Nose-in, Side-out Operation

Y	OPTIONS
N	Non-adjustable 
P	Push Style Manual Override 

Z	FLOW
	NOMINAL CAPACITY
3200	0-320 LPM



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