

Vickers® by Danfoss

## Pressure Relief



Sequence, Unloading, Back Pressure,  
Counterbalance, and Reducing Valves

"R", "UR", and "X" 03/06/10/12 Series

Pressures to 210 bar (3000 psi) – Flows to 284 l/min (75 USgpm)



# Introduction

## “ R ” Series Sequence, Unloading, Back Pressure, and Counterbalance Valves

There are several configurations of this basic valve which can be made by changing cover positions. The following outlines each type of function.

### Sequence and Unloading

Vickers by Danfoss “Hydrocushion” type pressure control valves are used for the control of unloading and sequence of oil flow in hydraulic systems, induced by a pressure rise, directly or by remote means. They are available in the following types: sequence valve, Type 2—directly operated; sequence valve, Type 3—remotely controlled; unloading valve, Type 4—remotely controlled.

### Back Pressure

Back pressure valves are designated as Type 1—internally operated. They are used to provide back pressure on the hydraulic actuator to prevent

overrunning. A remote ‘P’ version is also available for use in braking circuits.

### Counterbalance

Vickers by Danfoss “Hydrocushion” type counterbalance valves are used for the control of unloading and sequence of oil flow in hydraulic systems, induced by pressure rise either directly or by remote means. They are available in the following types: counterbalance valve, Type 1—internally operated; counterbalance valve, Type 4—remotely controlled. These valves are usually applied in a system to keep a vertical load from falling. All models provide free reverse flow by means of an integral check valve. (Refer to valves without integral check when reverse free flow is not required.)

### “ UR ” Series Unloading Relief Valves with Integral Check Module

An integral check valve prevents return flow from the accumulator through the unloading valve. In an accumulator

system, the valve cuts out automatically when the accumulator pressure reaches adjusted maximum. At cut-in pressure (approximately 85% of adjusted maximum), the valve directs delivery to the accumulator and the hydraulic system automatically.

In a double pump system, the valve automatically sequences the pumps to deliver a large volume of oil at low pressure and a small volume of oil at high pressure.

Models designated “URT” have threaded ports and require a separate check valve to function as an unloading circuit.

### “ X ” Series Pressure Reducing Valves

These pressure reducing valves maintain a reduced level of outlet pressure regardless of variations in inlet pressure above the pressure setting of the valve. The valves also allow reverse free flow at pressures below the setting of the valve.

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# Series R(C)\*-03/06/10/12 Sequence, Unloading, Back Pressure, and Counterbalance Valves

## Ratings

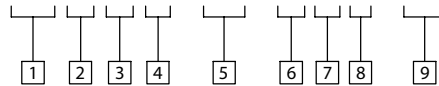
Rated Pressure (Maximum)*	210 bar (3000 psi)
Rated Capacity (Maximum)**	
R*-03	45 l/min (12 USgpm)
R*-06	114 l/min (30 USgpm)
R*-10 and R*-12	284 l/min (75 USgpm)

\* 140 bar (2000 psi) permitted on the full piston area at the bottom cover ( "P" connection), and at the top cover (spring chamber). See tank drain information on page 4.

\*\*Rated capacities are based on using fluid with a specific gravity of 0.865 and a viscosity of 20 cSt (100 SUS).

## Model Code

**(F3)R(C)S - 06 - B P 1 - 30**



<p><b>1</b> Special seals</p> <p>F3 – For mineral oil and fire resistant fluids. Mounting face seals of RCG model are standard Buna-N unless specified as F3.</p> <p>Blank – Omit for standard, R(C)S, and R(C)T models.</p>	<p><b>5</b> Valve size</p> <p>03 – 3/8" pipe or 0.7500-16 UNF-2B straight thread (0.500 tubing)</p> <p>06 – 3/4" pipe or 1.0625-12 UN-2B straight thread (0.750 tubing)</p> <p>10 – 1 1/4" pipe or 1.6250-12 UN-2B straight thread (1.250 tubing)</p> <p>12 – 1 1/2" pipe or 1.8750-12 UN-2B straight thread (1.500 tubing) (not available in R(C)G models)</p>	<p><b>7</b> Remote control connection</p> <p>P – Auxiliary remote pressure control connection (not available with X, Y, or Z pressure ranges or in R(C)G-03 models)</p> <p>Blank – Omit if not required</p>
<p><b>2</b> Valve type</p> <p>R – Pressure control valve</p>	<p><b>6</b> Pressure range</p> <p>X – 0,7 to 2,1 bar (10 to 30 psi)</p> <p>Y – 2,1 to 4,1 bar (30 to 60 psi)</p> <p>Z – 4,1 to 8,5 bar (60 to 125 psi)</p> <p>A – 5,2 to 17,2 bar (80 to 250 psi)</p> <p>B – 8,5 to 35 bar (125 to 500 psi)</p> <p>D – 17,2 to 70 bar (250 to 1000 psi)</p> <p>F – 35 to 140 bar (475 to 2000 psi)</p>	<p><b>8</b> Valve application type</p> <p>1 – Internal drain directly operated</p> <p>2 – External drain directly operated</p> <p>3 – External drain remotely operated</p> <p>4 – Internal drain remotely operated</p>
<p><b>3</b> Integral check valve</p> <p>C – Reverse free flow check</p>	<p><b>9</b> Design number</p> <p>Subject to change. Installation dimensions same for designs 30 through 39.</p>	
<p><b>4</b> Connections</p> <p>G – Manifold or subplate mounting</p> <p>S – SAE straight thread</p> <p>T – NPTF thread*</p> <p>*Not recommended</p>		

# Series R(C)\*-03/06/10/12 Sequence, Unloading, Back Pressure, and Counterbalance Valves

## General Data

Vickers by Danfoss "hydrocushion" type pressure control valves are used to control the sequencing, unloading, back pressure, and counterbalancing of oil flow in hydraulic systems. Control is initiated by a pressure rise which can be sensed either internally (directly) or remotely. Models are available with or without integral reverse free flow checks.

## Pressure Adjustment

Pressure ranges – (see model code page 3) are maximum controllable, and each model selected should be well within the range given to afford fine increments of adjustment. Pressure setting must be at least 17 bar (250 psi) lower than the system relief valve setting.

Pressure can be adjusted by loosening a jam nut and turning an adjustment screw. Turning clockwise increases pressure, and turning counterclockwise decreases pressure.

## Installation Data

### Mounting

Because all R(C)T and R(C)S models have optional pressure inlets connected by a through passage, the valves may be mounted "in-line". The valves may also be teed to a line by using either one of the pressure inlets and plugging the other.

The remote pressure control connection on type 3 and 4 valves must be connected to an external pilot pressure source sufficient to operate the valve at the desired pressure setting and flow conditions.

### Tank Drain

The discharge outlet of valve types 1 and 4 must be piped to tank at atmospheric pressure. The drain connection on types 2 and 3 must be piped directly to tank at atmospheric pressure. Any pressure at the drain port must be added to the pressure setting of the valve.

## Auxiliary Remote Pressure Control "P"

All models (except R(C)G -03 and those with an "X", "Y", or "Z" pressure adjustment range in their model code) are available with an auxiliary remote control connection. Required pressure at the auxiliary connection is  $\frac{1}{16}$  of the normally required control pressure for the "F" pressure range and  $\frac{1}{8}$  of the normally required control pressure for the "A", "B", and "D" pressure ranges. (This applies to -22 design and up.)

### Brake Valve

A brake valve is used in the exhaust line of a hydraulic motor to: 1) prevent overspeeding when an overrunning load is applied to the motor shaft; and 2) prevent excessive pressure buildup when decelerating or stopping a load.

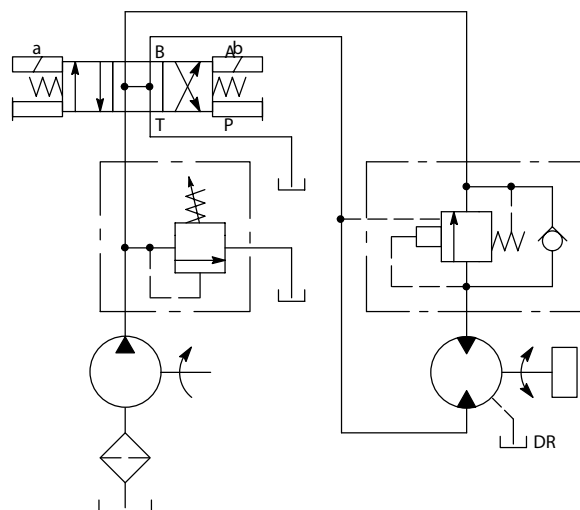
When the "RC" valve is used as a brake valve, it has a solid spool (no drain hole through the center), and there is a remote operating pressure connection in the bottom cover directly under the spool. This connection is teed into the supply line to the motor. The internal control connection is also used under the small piston and senses pressure from the primary port of the "RC" valve, which is connected to the motor exhaust port.

When the load is being accelerated, pressure is maximum at the motor inlet and under the large area of the brake valve spool, holding it in the full open position and permitting free flow from the exhaust port of the motor.

When the motor gets up to speed, load pressure still holds the brake valve open unless the load tries to run away. If this happens, the pressure falls off at the motor inlet and in the remote control pressure passage. The spring force tends to close the valve, thus increasing the back pressure on the motor, tending to brake it.

When the directional valve is shifted to neutral, inertia may cause the motor to continue rotating against the brake valve. Until the motor stops turning, it will operate as a pump, drawing fluid from the motor outlet through the directional valve and circulating it back to the motor inlet. Motor leakage oil will be made up by drawing oil into the loop through the tank port of the valve. At this time, pressure at the motor outlet tending to bring it to a stop will be whatever is required under the small piston to overcome the brake valve setting.

## Typical Application: Brake Valve



# Series R(C)\*-03/06/10/12 Sequence, Unloading, Back Pressure, and Counterbalance Valves

## Pressure Drop

The following table lists approximate pressure drops ( $\Delta P$ ) when passing flow of fluid with a specific gravity of 0.865 and a viscosity of 20 cSt (100 SUS).

Valve	Reverse Free Flow Pressure Drop	
	Flow l/min (USgpm)	$\Delta P$ bar (psi)
RC*-03	45 (12)	5,5 (80)
RC*-06	114 (30)	3,4 (50)
RC*-10	189 (50)	2,8 (40)
RC*-12	189 (50)	2,4 (35)

For any other flow rate ( $Q_1$ ), the approximate pressure drop ( $\Delta P_1$ ) can be calculated using the following formula:  

$$\Delta P_1 = \Delta P (Q_1 / Q_2)^2.$$

For any other viscosity of fluid, the pressure drop will change according to the following table:

Viscosity cSt (SUS)	Approximate % of $\Delta P$
14 (75)	93
27 (150)	111
38 (200)	119
46 (250)	126
56 (300)	132
64 (350)	137
74 (400)	141

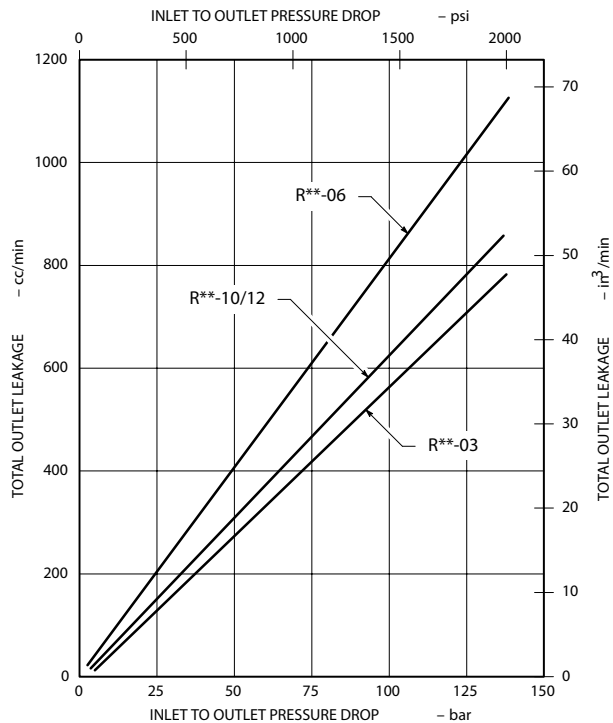
For any other specific gravity ( $G_1$ ), the approximate pressure drop ( $\Delta P_1$ ) can be calculated using the following formula:  

$$\Delta P_1 = \Delta P (G_1 / G).$$

The specific gravity of fluid may be obtained from its producer. The value is higher for fire-resistant fluids than for oil.

## Maximum Total Leakage vs. Pressure Drop

The following graph shows the relationship between maximum total leakage and pressure drop for fluid with a specific gravity of 0.865 and a viscosity of 20 cSt (100 SUS). Leakage is approximately proportional to viscosity in centistokes.



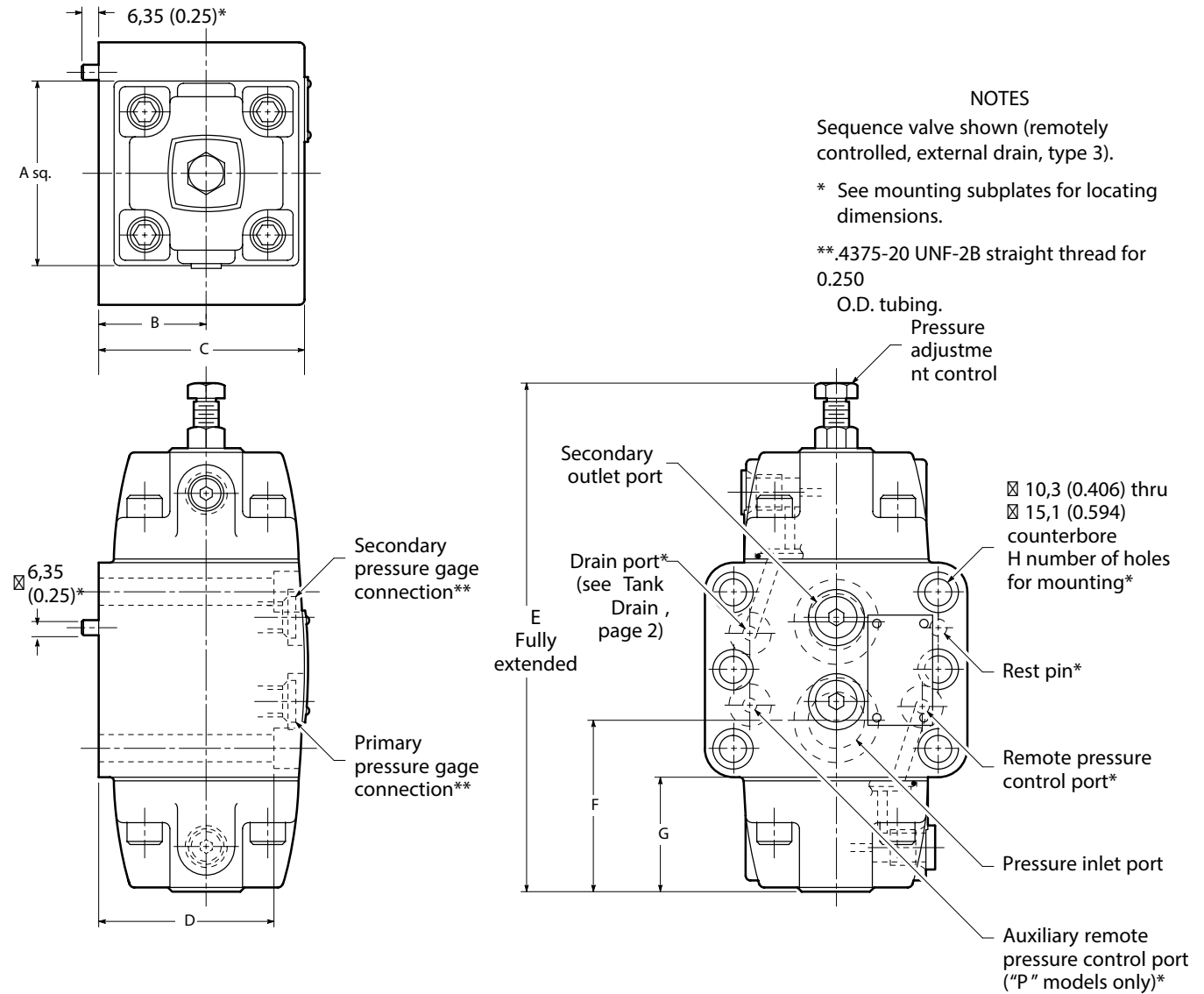
# Series R(C)\*-03/06/10/12 Sequence, Unloading, Back Pressure, and Counterbalance Valves

## Installation Dimensions

Millimeters (inches)

Subplate or Manifold Mounted Models

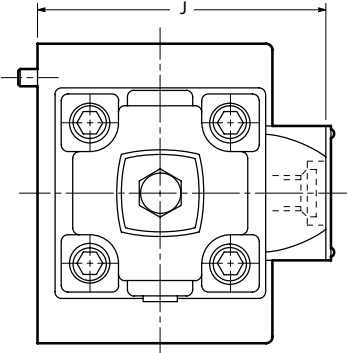
RG-\*\*-\*\*-30 Without Check



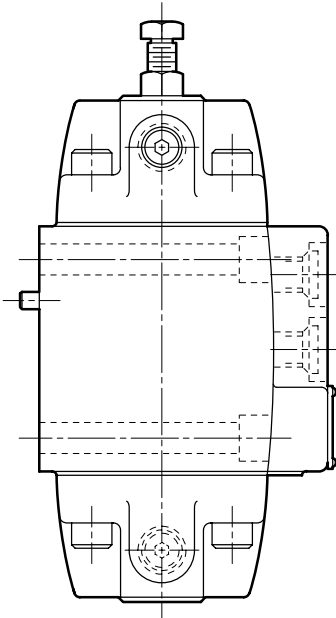
Model	A	B	C	D	E	F	G	H	J	NFPA Interface
R(C)G-03-**-30	57,2 (2.25)	36,6 (1.44)	68,1 (2.68)	55,9 (2.20)	178,6 (7.03)	47,5 (1.87)	30,0 (1.18)	4	90,4 (3.56)	P03
R(C)G-06-**-30	71,4 (2.81)	41,1 (1.62)	79,2 (3.12)	73,7 (2.90)	201,4 (7.93)	67,6 (2.66)	45,2 (1.78)	4	98,6 (3.88)	P06
R(C)G-10-**-30	95,2 (3.75)	50,8 (2.00)	100,1 (3.94)	90,2 (3.55)	282,2 (11.11)	71,6 (2.82)	44,4 (1.75)	6	130,0 (5.12)	P10

# Series R(C)\*-03/06/10/12 Sequence, Unloading, Back Pressure, and Counterbalance Valves

RCG- \*\* - \*\* -30 With Check

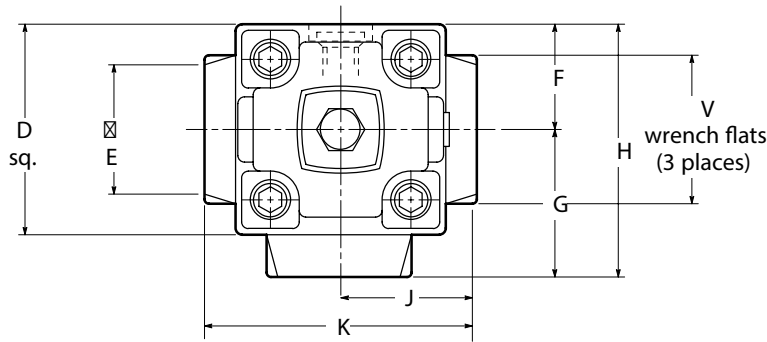


NOTE  
Sequence valve shown (remotely controlled, external drain, type 3).



# Series R(C)\*-03/06/10/12 Sequence, Unloading, Back Pressure, and Counterbalance Valves

Threaded Port Models  
RS/T-\*\*-\*\*-30 Without Check



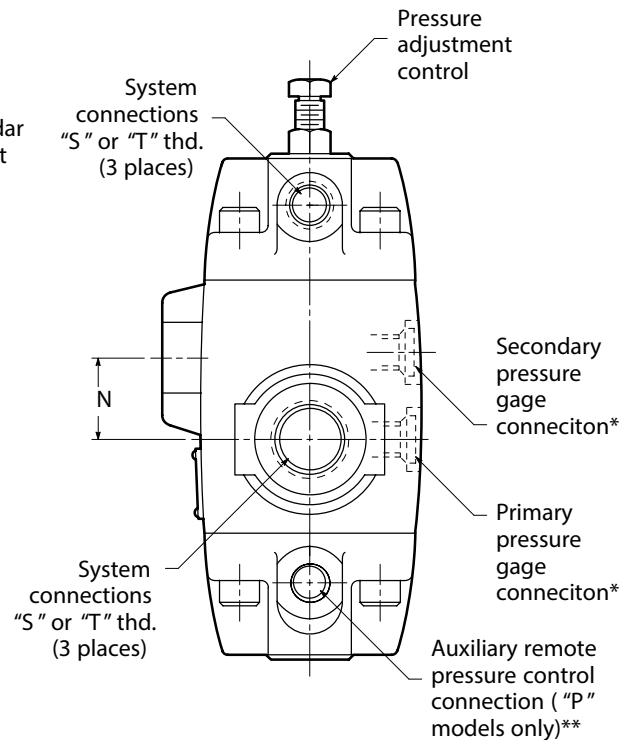
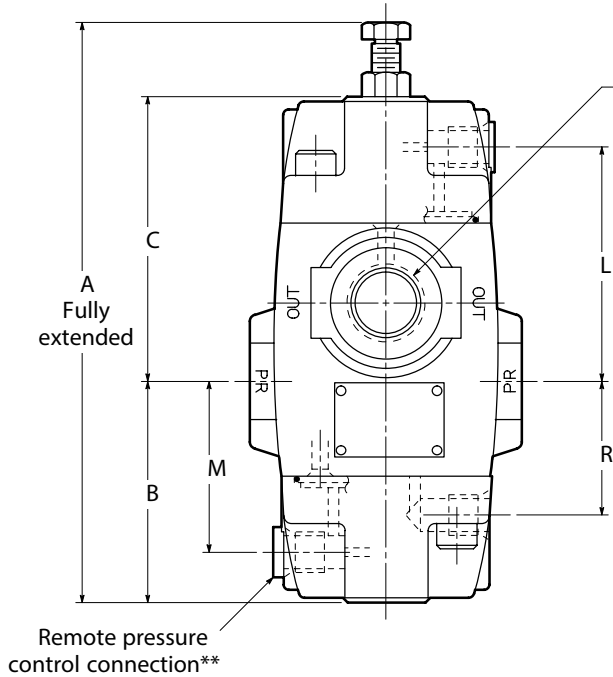
### NOTES

Sequence valve shown (directly operated, external drain, type 2).

All external connections are straight thread (except inlet and outlet ports of R(C)T models).

\*.4375-20 UNF-2B straight thread for 0.250 O.D. tubing.

\*\* .5627-18 UNF-2B thread

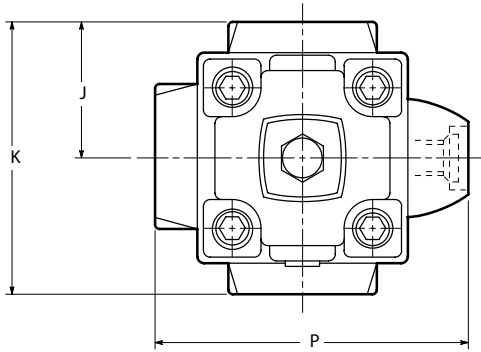


Model	A	B	C	D	E	F	G	H	J	K
R(C)S/T-03-**-30	178,6 (7.03)	53,3 (2.12)	96,8 (3.81)	59,4 (2.34)	35,1 (1.38)	29,7 (1.17)	39,6 (1.56)	70,9 (2.79)	35,1 (1.38)	69,8 (2.75)
R(C)S/T-06-**-30	201,4 (7.93)	75,4 (2.97)	97,8 (3.85)	74,7 (2.94)	47,8 (1.88)	37,3 (1.47)	50,8 (2.00)	88,1 (3.47)	47,8 (1.88)	95,2 (3.75)
R(C)S/T-10-**-30	282,2 (11.11)	84,1 (3.31)	154,2 (6.07)	98,6 (3.88)	82,6 (3.25)	49,3 (1.94)	68,3 (2.69)	117,6 (4.63)	53,8 (2.12)	108,0 (4.25)
R(C)S/T-12-**-30	282,2 (11.11)	84,1 (3.31)	154,2 (6.07)	98,6 (3.88)	82,6 (3.25)	49,3 (1.94)	68,3 (2.69)	117,6 (4.63)	53,8 (2.12)	108,0 (4.25)

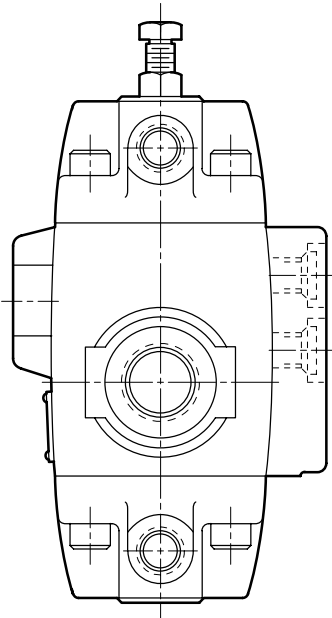


# Series R(C)\*-03/06/10/12 Sequence, Unloading, Back Pressure, and Counterbalance Valves

RCS/T-\*\*-\*\*-30 With Check



**NOTE**  
Sequence valve shown (remotely controlled, external drain, type 3).



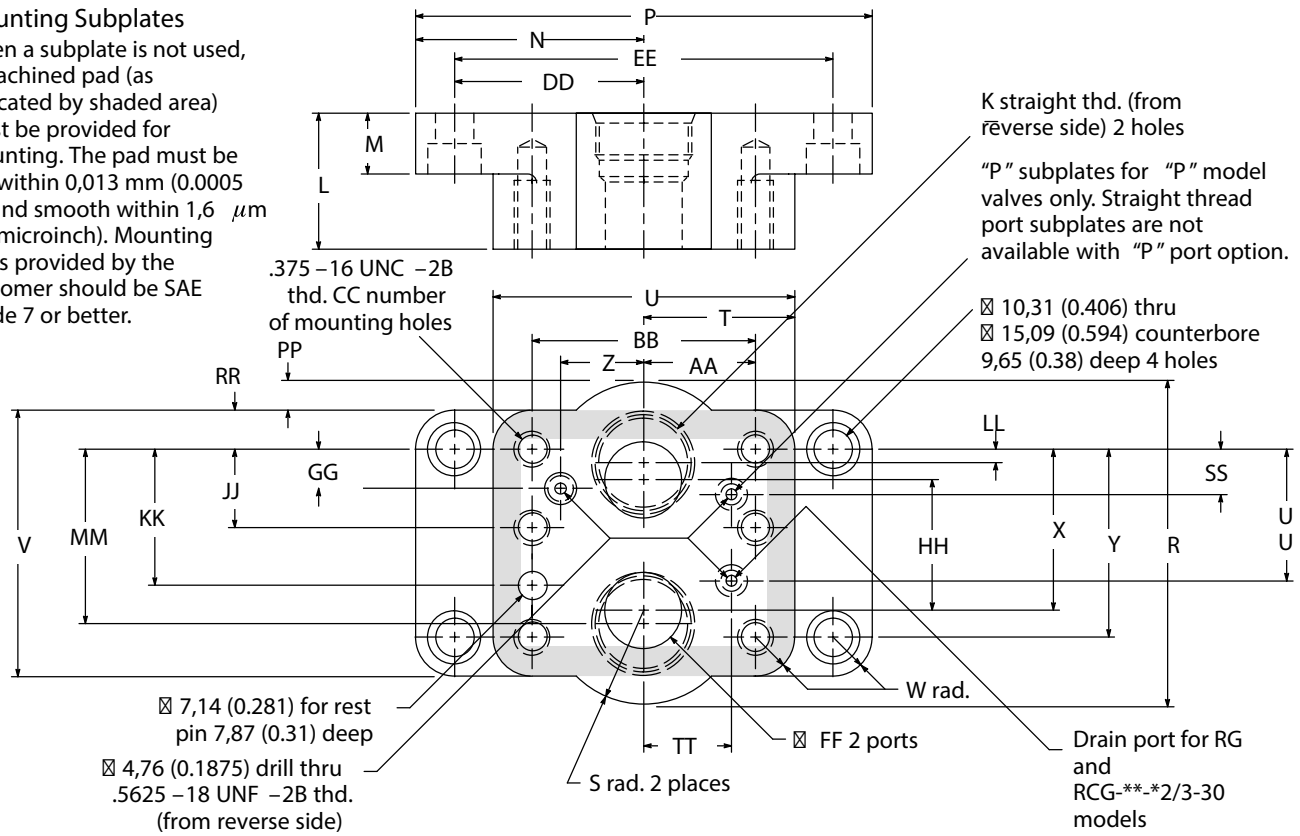
Model	L	M	N	P	R ●	"S" Str. Thd. RS and RCS Models	"T" Str. Thd. ■ RT and RCT Models	V
R(C)S/T-03-**-30	58,7 (2.31)	42,9 (1.69)	23,1 (0.91)	93,7 (3.69)	38,9 (1.53)	.7500 -16 UNF -2B	3/8	35,1 (1.38)
R(C)S/T-06-**-30	79,5 (3.13)	57,2 (2.25)	27,2 (1.07)	108,0 (4.25)	46,7 (1.84)	1.0625 -12 UN -2B	3/4	50,8 (2.00)
R(C)S/T-10-**-30	80,3 (3.16)	70,6 (2.78)	28,7 (1.13)	147,6 (5.81)	57,2 (2.25)	1.6250 -12 UN -2B	1 1/4	86,4 (3.40)
R(C)S/T-12-**-30	80,3 (3.16)	70,6 (2.78)	28,7 (1.13)	147,6 (5.81)	57,2 (2.25)	1.8750 -12 UN -2B	1 1/2	86,4 (3.40)

- For "P" models only. See model code.
- Not recommended.

# Series R(C)\*-03/06/10/12 Sequence, Unloading, Back Pressure, and Counterbalance Valves

## Mounting Subplates

When a subplate is not used, a machined pad (as indicated by shaded area) must be provided for mounting. The pad must be flat within 0,013 mm (0.0005 in) and smooth within 1,6  $\mu\text{m}$  (63 microinch). Mounting bolts provided by the customer should be SAE grade 7 or better.



Model	K	Tube O.D.	L	M	N	P	R	S	T	U	V
RXGM-03S-(P)-20	.7500 - 16 UNF -2B	1/2"	25,4 (1.00)	19,0 (0.75)	63,5 (2.50)	127,0 (5.00)	76,2 (3.00)	23,9 (0.94)	43,7 (1.72)	87,4 (3.44)	63,5 (2.50)
RXGM-06SX-(P)-20	1.3125 - 1 2 UN -2B	1"	31,8 (1.25)	19,0 (0.75)	73,2 (2.88)	146,0 (5.75)	117,3 (4.62)	39,6 (1.56)	50,8 (2.00)	101,6 (4.00)	82,6 (3.25)
RXGM-10S-(P)-30	1.6250 - 1 2 UN -2B	1 1/4"	47,8 (1.88)	22,4 (0.88)	79,2 (3.12)	158,8 (6.25)	146,0 (5.75)	47,8 (1.88)	58,7 (2.31)	117,3 (4.62)	104,6 (4.12)

Model	W	X	$\pm 0,13$ Y ( $\pm 0,005$ )	Z	AA	BB	CC	DD	$\pm 0,013$ EE ( $\pm 0,005$ )	FF	GG
RXGM-03S-(P)-20	10,4 (0.41)	35,8 (1.41)	42,87 (1.688)	25,4 (1.00)	33,3 (1.31)	66,5 (2.62)	4	53,1 (2.09)	106,37 (4.188)	14,2 (0.56)	21,3 (0.84)
RXGM-06SX-(P)-20	10,2 (0.44)	49,3 (1.94)	60,32 (2.375)	33,3 (1.31)	39,6 (1.56)	79,2 (3.12)	4	62,0 (2.44)	123,82 (4.875)	23,1 (0.91)	20,6 (0.81)
RXGM-10S-(P)-30	10,4 (0.41)	67,6 (2.66)	84,12 (3.312)	44,4 (1.75)	48,5 (1.91)	96,8 (3.81)	6	69,1 (2.72)	138,12 (5.438)	28,4 (1.12)	24,6 (0.97)

Model	HH	JJ ■	KK	LL	MM	PP	RR	SS	TT	UU	NFPA Interface
RXGM-03S-(P)-20	28,4 (1.12)	—	31,8 (1.25)	4,8 (0.19)	38,1 (1.50)	6,4 (0.25)	10,4 (0.41)	—	25,4 (1.00)	21,3 (0.84)	P03
RXGM-06SX-(P)-20	38,1 (1.50)	—	44,4 (1.75)	6,4 (0.25)	53,8 (2.12)	17,5 (0.69)	11,2 (0.44)	16,8 (0.66)	33,3 (1.31)	39,6 (1.56)	P06
RXGM-10S-(P)-30	50,8 (2.00)	42,2 (1.66)	62,7 (2.47)	7,9 (0.31)	76,2 (3.00)	20,6 (0.81)	10,4 (0.41)	24,6 (0.97)	44,4 (1.75)	59,4 (2.34)	P10

■ RXGM-03S/06SX require 4 valve mounting screws. RXGM-10S requires 6 valve mounting screws.

# Series R(C)\*-03/06/10/12 Sequence, Unloading, Back Pressure, and Counterbalance Valves

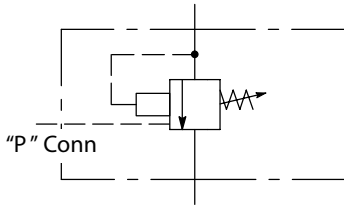
## Graphical Symbols

### Type P Back Pressure and Counterbalance Valves

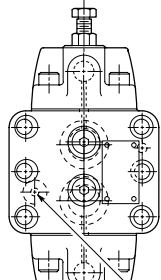
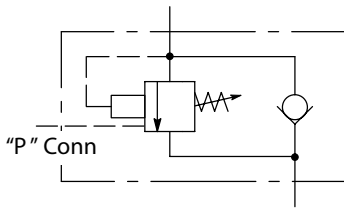
Auxiliary remote control operated with "P" connection – Internal drain (model "P1" shown)

#### R(C)G Valves

##### Back Pressure (RG)



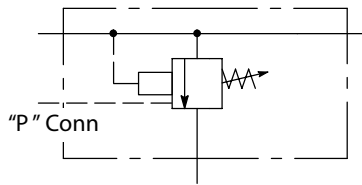
##### Counterbalance (RCG)



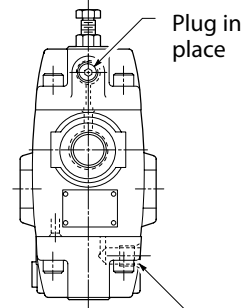
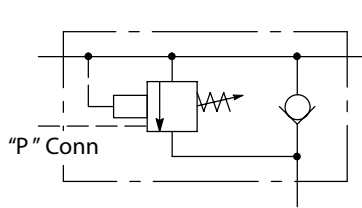
Auxiliary remote pressure control port for "P" models only

#### R(C)S/T Valves

##### Back Pressure (RS/T)



##### Counterbalance (RCS/T)



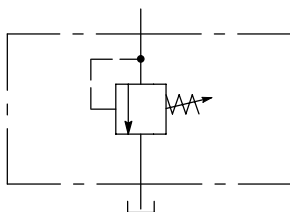
Plug in place  
Auxiliary remote pressure control port for "P" models only

### Type 1 Back Pressure and Counterbalance Valves

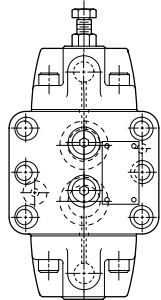
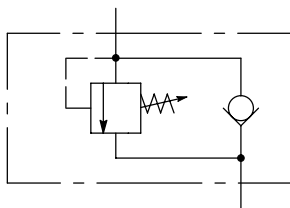
Internally operated – Internal drain

#### R(C)G Valves

##### Back Pressure (RG)

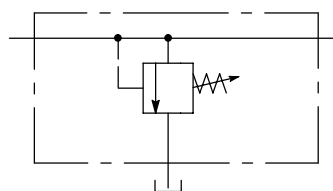


##### Counterbalance (RCG)

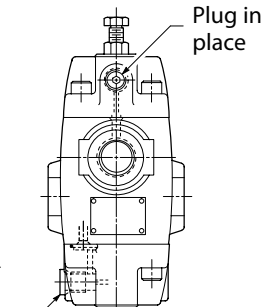
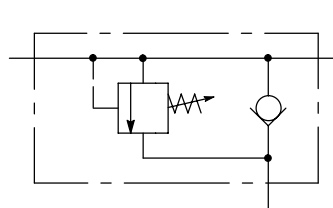


#### R(C)S/T Valves

##### Back Pressure (RS/T)



##### Counterbalance (RCS/T)



Plug in place  
Plug in place

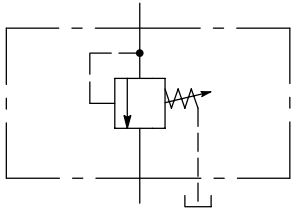
# Series R(C)\*-03/06/10/12 Sequence, Unloading, Back Pressure, and Counterbalance Valves

## Type 2 Sequence Valves

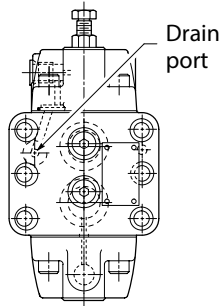
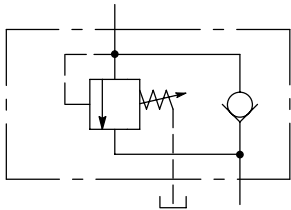
Internally operated – External drain

### R(C)G Valves

(RG)

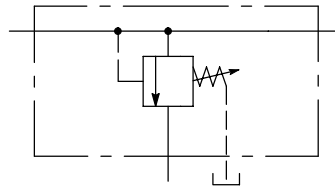


(RCG)

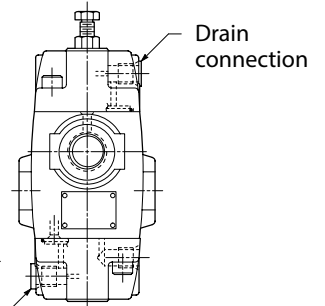
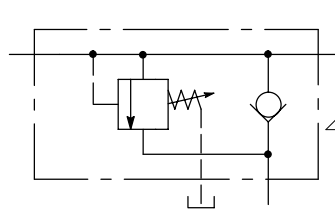


### R(C)S/T Valves

(RS/T)



(RCS/T)

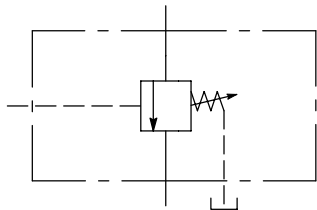


## Type 3 Sequence Valves

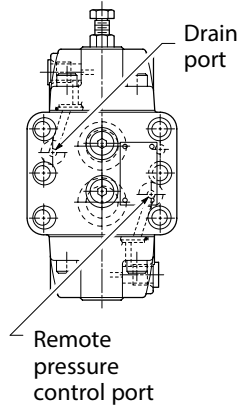
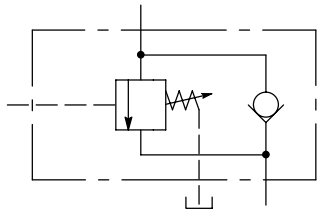
Remote control operated – External drain

### R(C)G Valves

(RG)

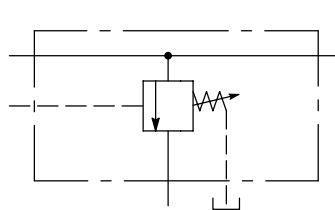


(RCG)

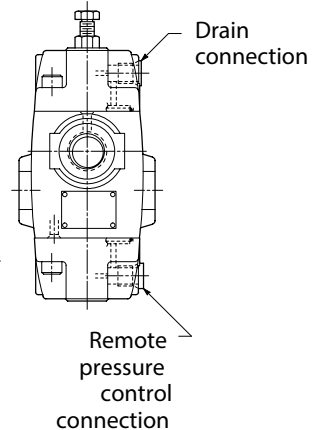
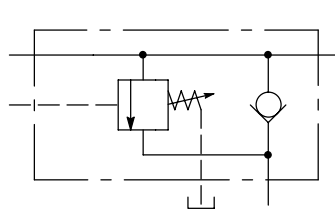


### R(C)S/T Valves

(RS/T)



(RCS/T)



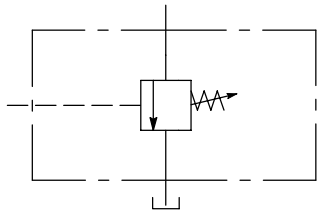
# Series R(C)\*-03/06/10/12 Sequence, Unloading, Back Pressure, and Counterbalance Valves

## Type 4 Unloading and Counterbalance Valves

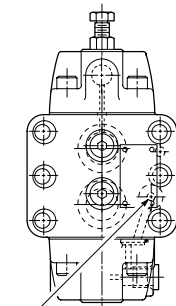
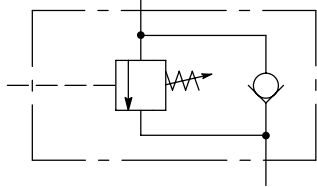
Remote control operated – Internal drain

### R(C)G Valves

#### Unloading (RG)



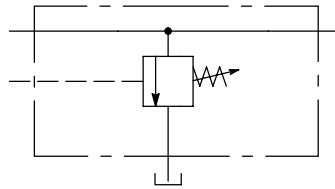
#### Counterbalance (RCG)



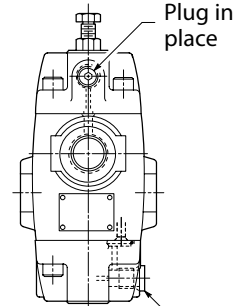
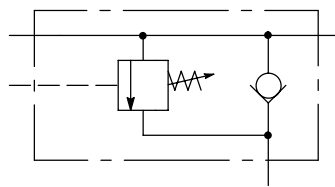
Remote pressure control port

### R(C)S/T Valves

#### Unloading (RS/T)



#### Counterbalance (RCS/T)



Remote pressure control connection

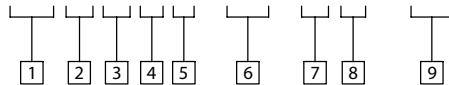
# Series URT\*-06/10 Unloading Relief Valves

## Ratings

Rated Pressure	(Maximum)	210 bar (3000 psi)
Rated Capacity	(Maximum)	
	URT*-06	76 l/min (20 USgpm)
	URT*-10	189 l/min (50 USgpm)

## Model Code

**(F3)U R T 1 - 06 - C(V) - 10**



<p><b>1</b> Special seals</p> <p>F3 – For mineral oil and fire resistant fluids Blank – Omit for standard models</p>	<p><b>4</b> Connections</p> <p>T – NPTF thread* *Not recommended</p>	<p><b>7</b> Cutout pressure range</p> <p>B – 24 to 70 bar (350 to 1000 psi) C – 35 to 140 bar (500 to 2000 psi) F – 103 to 210 bar (1500 to 3000 psi)</p>
<p><b>2</b> Valve function</p> <p>U – Unloading valve</p>	<p><b>5</b> Drain</p> <p>1 – Externally drained 2 – Internally drained</p>	<p><b>8</b> High vent spring</p> <p>V – Optional high vent spring installed Blank – Omit if not required</p>
<p><b>3</b> Valve type</p> <p>R – Pressure control valve</p>	<p><b>6</b> Valve size</p> <p>06 – 3/4" pipe 10 – 1 1/4" pipe</p>	<p><b>9</b> Design number</p> <p>Subject to change. Installation dimensions same for designs 10 through 19.</p>

## General Data

These valves are used in oil hydraulic circuits where a pressure regulator is required to automatically unload the pump by diverting the pump delivery to the reservoir, at low pressure, when the accumulator pressure reaches the desired maximum (or "cut out") pressure. When the accumulator pressure drops to the "cut in" pressure (approximately 85% of the desired maximum), the valve directs pump delivery to the accumulator and

hydraulic system. The valve may also be used with a double pump to deliver a large volume of oil to the system at low pressure and a small volume at high pressure, serving the same function as an unloading valve. A separate right angle check valve, C2-815 (3/4") or C2-825 (1 1/4") must be provided to maintain accumulator hydraulic charge or unloading of high volume pump and prevent back flow when pump is unloaded.

## Pressure Adjustment

Pressure can be adjusted by loosening a jam nut and turning an adjustment screw. Turning clockwise increases pressure, and turning counterclockwise decreases pressure.

# Series URT\*-06/10 Unloading Relief Valves

## Installation Data

### Tank Drain

Back pressure at the tank discharge port of the URT1 series (externally drained) valves will not effect the operation at up to 85% of the inlet pressure. Back pressure at the tank discharge port of the URT2 series (internally drained) valves must not exceed 5% of the inlet pressure.

### CAUTION

For series URT1 only, the drain must be connected to tank through a surge free line so there will be no back pressure at this drain. Failure to connect drain can result in infinite system pressures and machine damage. Series URT2 has internal drain and this port is not used.

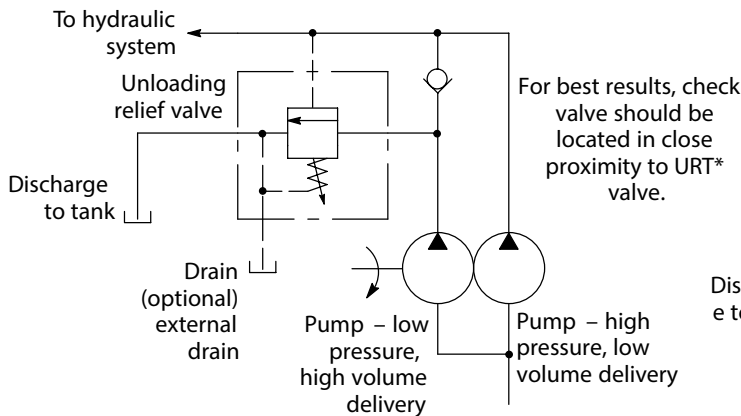
### Connections

Pressure inlet and outlet connections are connected by a through passage which permits use of either connection as an inlet.

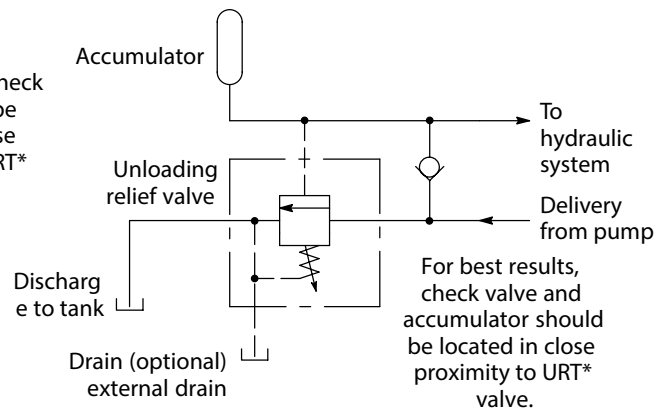
Model	Approximate Minimum Venting Pressures bar (psi) at Various Percentages of Maximum Rated Capacity			
	25%	50%	75%	100%
URT*-06-*-10	0,7 (10)	0,8 (11)	1,0 (15)	1,6 (23)
URT*-06-*-V-10	3,9 (56)	3,9 (57)	4,1 (59)	4,3 (63)
URT*-10-*-10	0,4 (6)	0,7 (10)	1,6 (23)	2,7 (39)
URT*-10-*-V-10	3,6 (52)	3,7 (54)	3,9 (57)	4,1 (59)

## Typical Applications

### Double Pump Circuit



### Accumulator Circuit

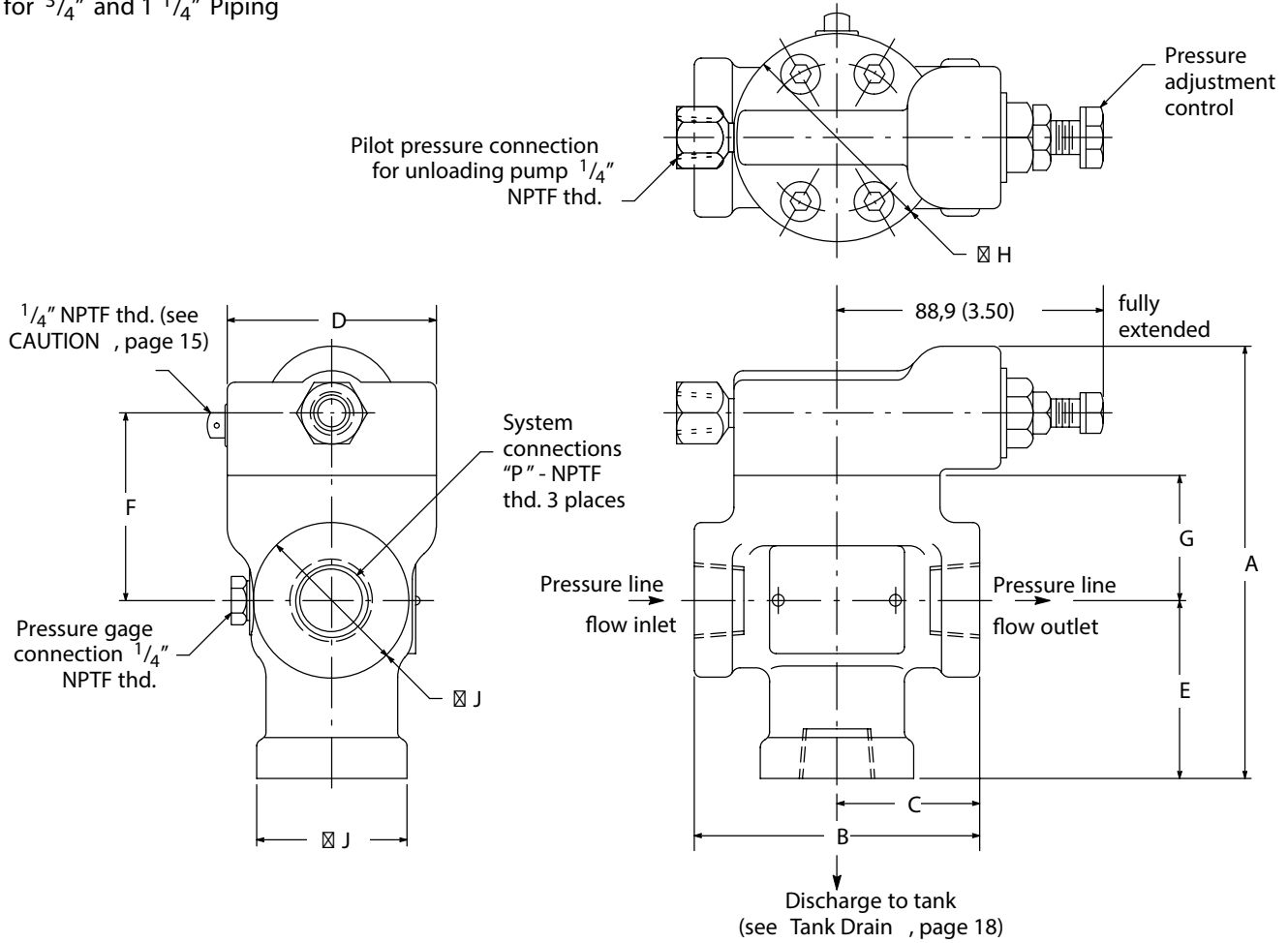


# Series URT\*-06/10 Unloading Relief Valves

## Installation Dimensions

Millimeters (inches)

URT1 and URT2 with Threaded Connections  
for 3/4" and 1 1/4" Piping



Model	"P" Piping Thd. Size NPTF	Nominal Capacity l/min (USgpm)	A	B	C	D	E	F	G	H	J
URT*-06-*-10	3/4"	76 (20)	158,8 (6.25)	108,0 (4.25)	53,8 (2.12)	77,7 (3.06)	65,0 (2.56)	68,3 (2.69)	46,0 (1.81)	76,2 (3.00)	57,2 (2.25)
URT*-10-*-10	1 1/4"	189 (50)	189,0 (7.44)	127,0 (5.00)	63,5 (2.50)	95,2 (3.75)	77,7 (3.06)	87,4 (3.44)	60,5 (2.38)	95,2 (3.75)	76,2 (3.00)



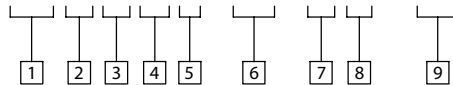
# Series URG\*-06/10 Unloading Relief Valves

## Ratings

Rated Pressure	(Maximum)	210 bar (3000 psi)
Rated Capacity	(Maximum)	
URT*-06		95 l/min (25 USgpm)
URT*-10		246 l/min (65 USgpm)

## Model Code

**(F3)U R G 1 - 06 - C(V) - 10**



<p><b>1</b> Special seals</p> <p>F3 – For mineral oil and fire resistant fluids</p> <p>Blank – Omit for standard models</p>	<p><b>4</b> Connections</p> <p>G – Manifold or subplate mounted</p> <hr/> <p><b>5</b> Drain</p> <p>1 – Externally drained</p> <p>2 – Internally drained</p> <hr/> <p><b>6</b> Valve size</p> <p>06 – 3/4" pipe</p> <p>10 – 1 1/4" pipe</p>	<p><b>7</b> Cutout pressure range</p> <p>B – 24 to 70 bar (350 to 1000 psi)</p> <p>C – 35 to 140 bar (500 to 2000 psi)</p> <p>F – 103 to 210 bar (1500 to 3000 psi)</p> <hr/> <p><b>8</b> High vent spring</p> <p>V – Optional high vent spring installed</p> <p>Blank – Omit if not required</p> <hr/> <p><b>9</b> Design number</p> <p>Subject to change. Installation dimensions same for designs 10 through 19.</p>
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## General Data

These valves are used in oil hydraulic circuits where a pressure regulator is required to automatically unload the pump by diverting the pump delivery to the reservoir, at low pressure, when the accumulator reaches the desired maximum (or "cut out") pressure. When the accumulator pressure drops to the "cut in" pressure (approximately 85% of the desired maximum), the valve directs pump delivery to the accumulator and hydraulic system. An integral check valve prevents return flow from the accumulator through the unloading valve.

The valve may also be used with a double pump to deliver a large volume of oil to the system at low pressure and a small volume at high pressure, serving the same function as a separate unloading valve and check valve.

### Pressure Adjustment

Pressure can be adjusted by loosening a jam nut and turning an adjustment screw. Turning clockwise increases pressure, and turning counterclockwise decreases pressure.

# Series URG\*-06/10 Unloading Relief Valves

## Installation Data

### Tank Drain

Back pressure at the tank discharge port of the URG1 series (externally drained) valves will not effect the operation at up to 85% of the inlet pressure. Back pressure at the discharge port of the URG2 series (internally drained) valves must not exceed 5% of the inlet pressure.

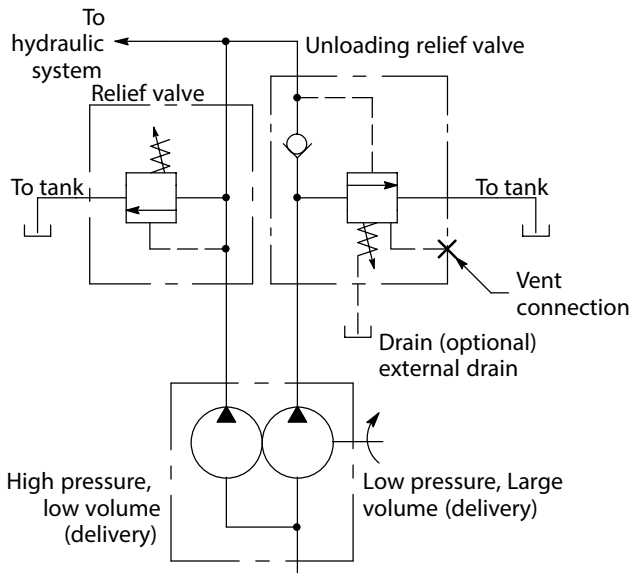
### CAUTION

For series URG1 only, the drain must be connected to the tank through a surge free line so there will be no back pressure at this drain. Failure to connect drain can result in infinite system pressures and machine damage. Series URG2 has internal drain and this port is not used.

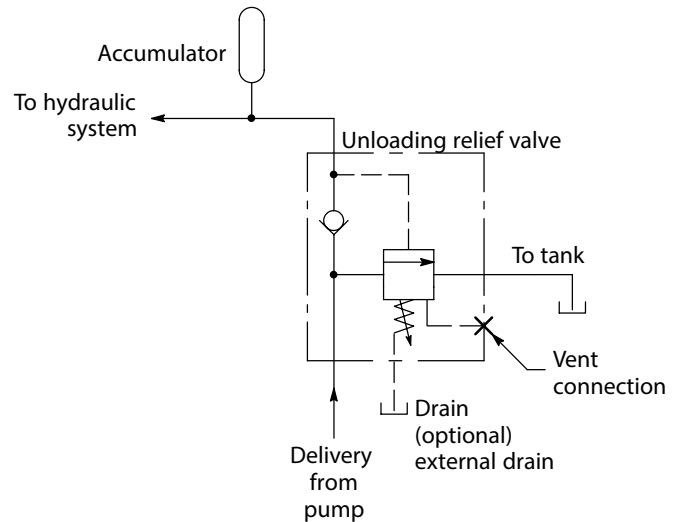
Model	Nominal Capacity l/min (USgpm)	Cut Out Pressure Range bar (psi)	Approximate Pressure Drop bar (psi)	
			Unloading	Via Check To Accumulator
URG*-06-B-10		24 to 70 (350 to 1000)		
URG*-06-C-10	95 (25),	35 to 140 (500 to 2000)	5,9 (85),	2,4 (35),
URG*-06-F-10		103 to 207 (1500 to 3000)		
URG*-10-B-10		24 to 70 (350 to 1000)		
URG*-10-C-10	246 (65),	35 to 140 (500 to 2000)	2,4 (35),	1,1 (16),
URG*-10-F-10		103 to 207 (1500 to 3000)		

## Typical Applications

### Double Pump Circuit



### Accumulator Circuit



# Series URG\*-06/10 Unloading Relief Valves

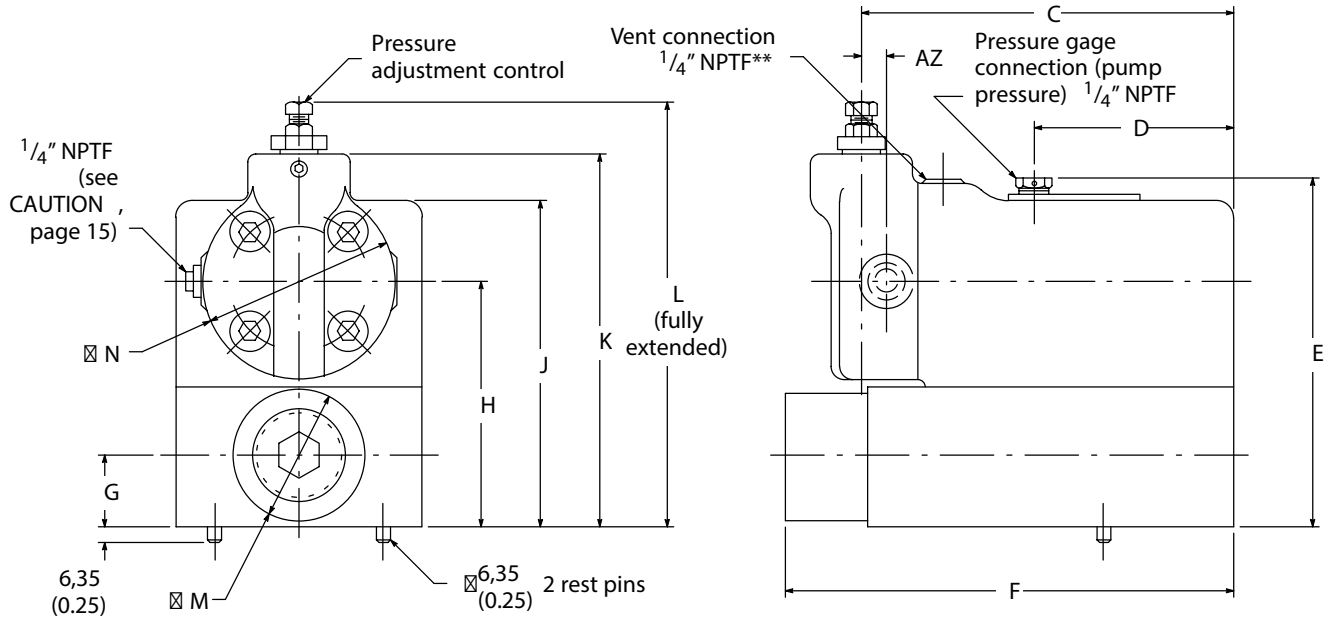
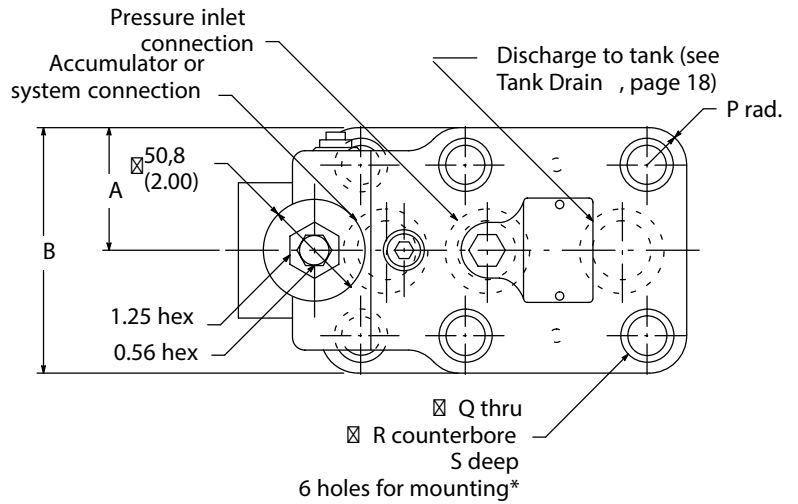
## Installation Dimensions

Millimeters (inches)

### URG\*-06/10 Valve

#### NOTES

- \* See mounting subplates for locating dimensions.
- \*\* Keep plugged except when circuit indicates connection for venting valve.



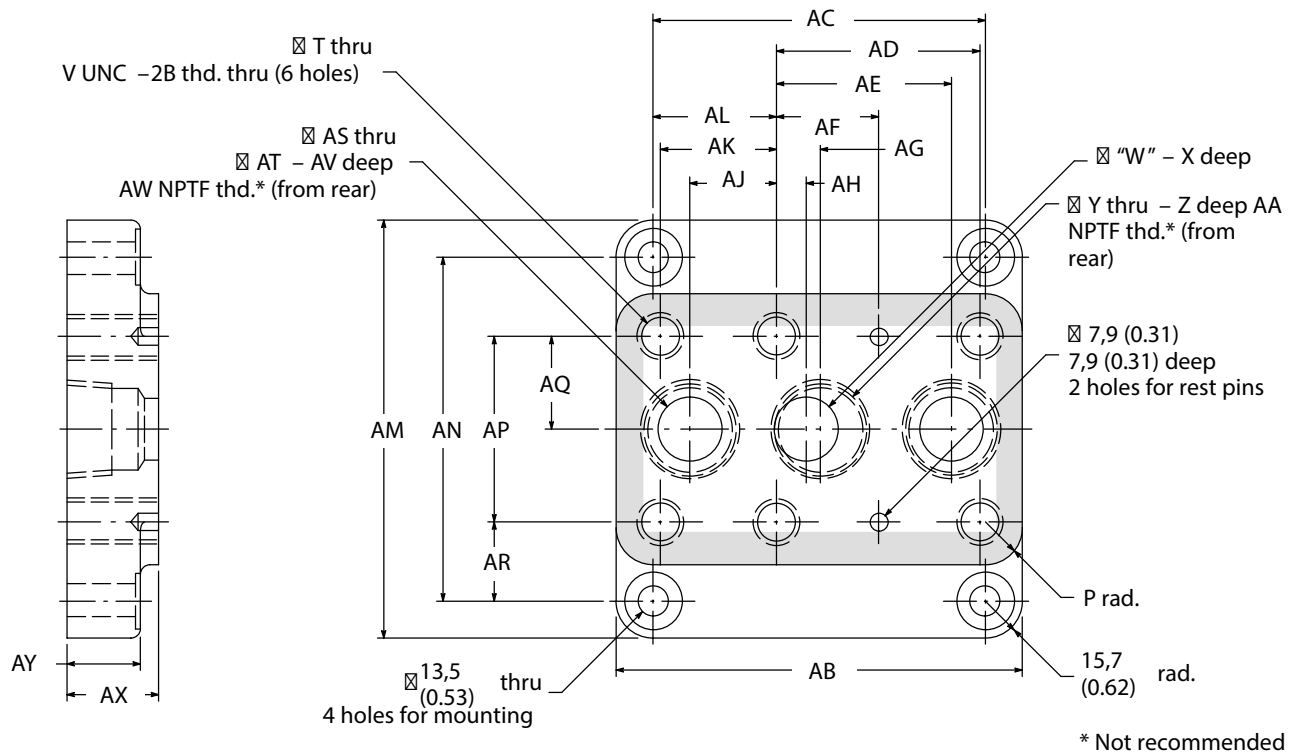
Model	A	B	C	D	E	F	G	H	J
URG*-06*-10	50,8 (2.00)	101,6 (4.00)	139,7 (5.50)	76,2 (3.00)	134,9 (5.31)	160,3 (6.31)	25,4 (1.00)	91,9 (3.62)	124,0 (4.88)
URG*-10*-10	60,5 (2.38)	120,6 (4.75)	179,3 (7.06)	95,2 (3.75)	168,1 (6.62)	217,4 (8.56)	33,3 (1.31)	117,3 (4.62)	157,2 (6.19)

Model	K	L	M	N	P	Q	R	S	AZ
URG*-06*-10	153,9 (6.06)	180,8 (7.12)	44,4 (1.75)	76,2 (3.00)	15,7 (0.62)	16,8 (0.66)	25,4 (1.00)	15,7 (0.62)	3,0 (0.12)
URG*-10*-10	179,3 (7.06)	206,2 (8.12)	63,5 (2.50)	95,2 (3.75)	19,0 (0.75)	17,8 (0.78)	29,5 (1.16)	19,0 (0.75)	1,5 (0.06)

# Series URG\*-06/10 Unloading Relief Valves

## Mounting Subplates



Model	P	T	V	W	X	Y	Z	AA	AB	AC
URG1M-06-10	15,7 (0.62)	14,0 (0.55)	.625 - 11	23,1 (0.91)	31,8 (1.25)	—	—	3/4"	144,5 (5.69)	112,71 (4.438)
URG1M-10-10	19,0 (0.75)	16,8 (0.66)	.750 - 10	28,4 (1.12)	11,2 (0.44)	38,1 (1.50)	30,5 (1.12)	1 1/4"	177,8 (7.00)	146,05 (5.750)

Model	AD	AE	AF	AG	AH	AJ	AK	AL	AM	AN
URG1M-06-10	66,5 (2.62)	55,6 (2.19)	33,3 (1.31)	11,2 (0.44)	10,2 (0.44)	33,3 (1.31)	46,0 (1.81)	46,0 (1.81)	162,1 (6.38)	130,18 (5.125)
URG1M-10-10	88,9 (3.50)	76,2 (3.00)	44,4 (1.75)	19,0 (0.75)	12,7 (0.50)	38,1 (1.50)	50,8 (2.00)	53,8 (2.12)	184,1 (7.25)	152,40 (6.000)

Model	AP	AQ	AR	AS	AT	AV	AW	AX	AY
URG1M-06-10	69,8 (2.75)	35,1 (1.38)	30,2 (1.19)	23,1 (0.91)	—	—	3/4"	31,8 (1.25)	25,4 (1.00)
URG1M-10-10	82,6 (3.25)	41,1 (1.62)	35,1 (1.38)	28,4 (1.12)	38,1 (1.50)	30,2 (1.19)	1 1/4"	38,1 (1.50)	31,8 (1.25)

# Series XSL/XTL-03 Pressure Reducing Valves

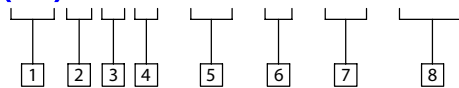
## Ratings

Rated Capacity (Maximum)	30 l/min (8 USgpm)
Adjustable Pressure Range	3,4 to 70 bar (50 to 1000 psi)*
Inlet Pressure (Maximum)	140 bar (2000 psi)

\* X\*L-03-B-10-S21 model has adjustable pressure range of 1,7 to 21 bar (25 to 300 psi) with maximum inlet pressure of 70 bar (1000 psi).

## Model Code

**(F3)X T L - 03 - B - 10 - S21**



### 1 Special seals

F3 – For mineral oil and fire resistant fluids  
Blank – Omit for standard models

### 2 Valve type

X – Pressure reducing valve

### 3 Connections

S – SAE straight thread  
T – NPTF thread\*

\* Not recommended

### 4 Pressure level

L – Low pressure type

### 5 Valve size

03 – 3/8" pipe

### 6 Pressure range

B – 3,4 to 70 bar (50 to 1000 psi)

### 7 Design number

Subject to change. Installation dimensions same for designs 10 through 19.

### 8 Special feature suffix

S21 – Adjustable pressure range of 1,7 to 21 bar (25 to 300 psi) with maximum inlet pressure of 70 bar (1000 psi)  
Blank – Omit if not required

## General Data

The operation of these Vickers by Danfoss reducing valves is such that reduced outlet pressure remains constant regardless of variation of inlet pressure above the selected pressure setting. Reverse free flow is allowable, providing the pressure at the reduced pressure port does not exceed the reduced pressure setting of the valve.

## Pressure Adjustment

A differential of at least 1,7 bar (25 psi) between inlet and outlet pressure must be maintained for proper functioning.

Adjustment of reduced outlet pressure is accomplished by loosening jam nut and turning pressure adjustment control. Clockwise rotation increases pressure. Counterclockwise rotation decreases pressure. Control adjustment has stops for minimum and maximum pressures.

## Drain Connection

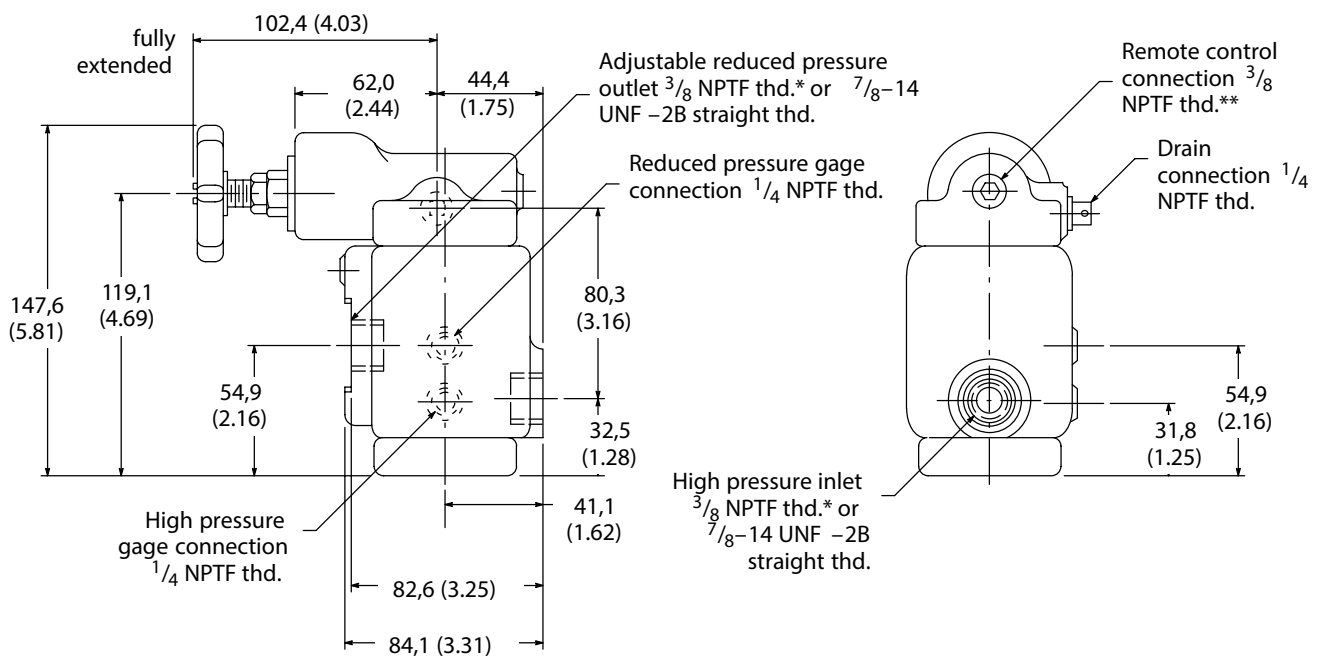
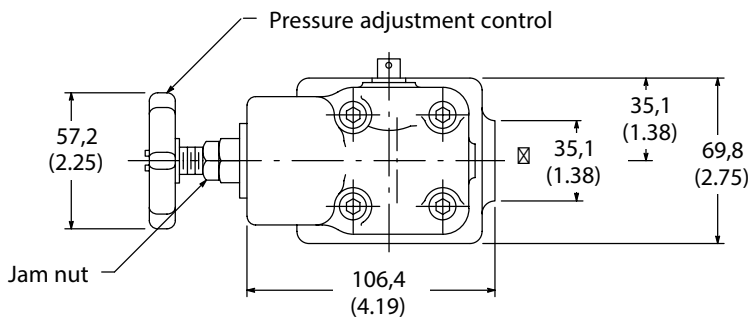
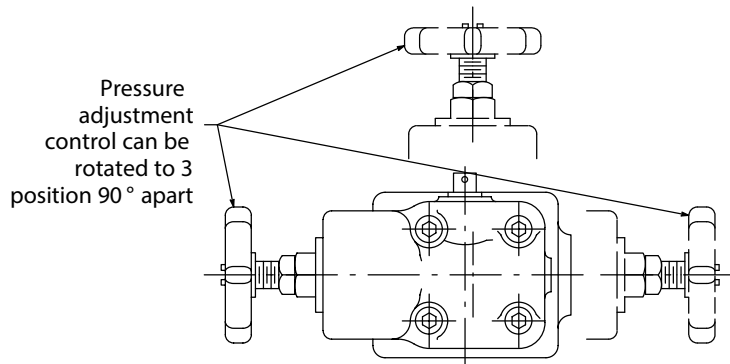
The drain connection must be piped directly to tank. Any pressure at this port must be added to the valve pressure setting.

# Series XSL/XTL-03 Pressure Reducing Valves

## Installation Dimensions

Millimeters (inches)

XS/TL-03-B-10 Valve



## NOTES

Model XSL-03-B-10 is supplied with  $\frac{7}{8}$ -14 straight thread system connections and a  $\frac{9}{16}$ -18 straight thread drain connection.

X\*L-03-B-10-S21 model has adjustable pressure range of 1,7 to 21 bar (25 to 300 psi) with maximum inlet pressure of 70 bar (1000 psi).

\* Not recommended.

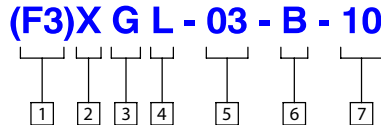
\*\* Reduced pressure may be adjusted remotely by connecting this port to pressure inlet port of CGR-02-\* -20 valve or C-175-\* -10 valve. Pressure setting of main valve must be higher than that of remote control.

# Series XGL-03 Pressure Reducing Valves

## Ratings

Rated Capacity (Maximum)	30 l/min (8 USgpm)
Adjustable Pressure Range	1,7 to 70 bar (25 to 1000 psi)
Inlet Pressure (Maximum)	140 bar (2000 psi)

## Model Code



<p><b>1</b> Special seals</p> <p>F3 – For mineral oil and fire resistant fluids</p> <p>Blank – Omit for standard models</p>	<p><b>3</b> Connections</p> <p>G – Manifold or subplate mounting</p>	<p><b>6</b> Pressure range</p> <p>B – 1,7 to 70 bar (25 to 1000 psi)</p>
<p><b>2</b> Valve type</p> <p>X – Pressure reducing valve</p>	<p><b>4</b> Pressure level</p> <p>L – Low pressure type</p>	<p><b>7</b> Design number</p> <p>Subject to change. Installation dimensions same for designs 10 through 19.</p>
	<p><b>5</b> Valve size</p> <p>03 – 3/8" nominal size</p>	

## General Data

The operation of these reducing valves is such that reduced outlet pressure remains constant regardless of variation of inlet pressure above the selected pressure setting. Reverse free flow is allowable, providing the pressure at the reduced pressure port does not exceed the reduced pressure setting of the valve.

## Pressure Adjustment

A differential of at least 1,7 bar (25 psi) between inlet and outlet pressure must be maintained for proper functioning.

Adjustment of reduced outlet pressure is accomplished by loosening jam nut and turning pressure adjustment control. Clockwise rotation increases pressure. Counterclockwise rotation decreases pressure. Control adjustment has stops for minimum and maximum pressures.

## Drain Connection

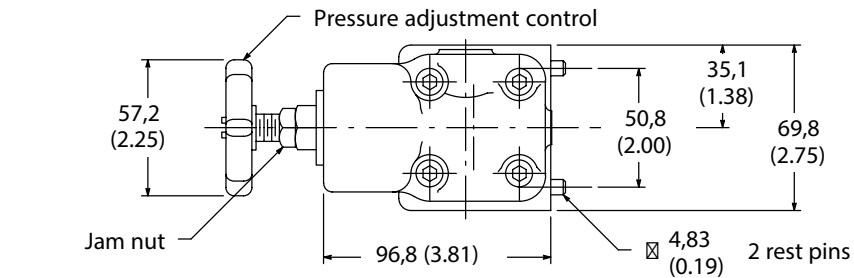
The drain connection must be piped directly to tank. Any pressure at this port must be added to the valve pressure setting.

# Series XGL-03 Pressure Reducing Valves

## Installation Dimensions

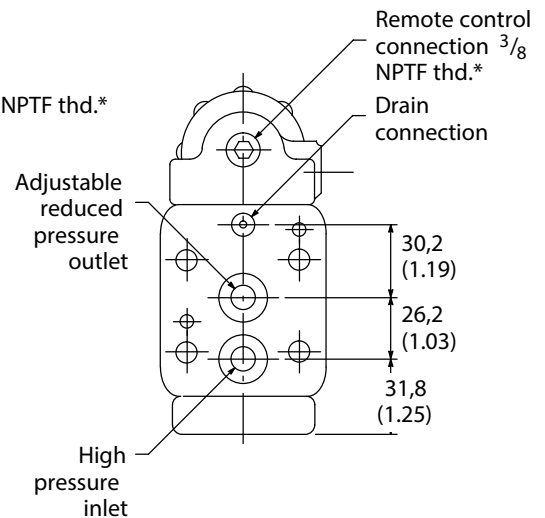
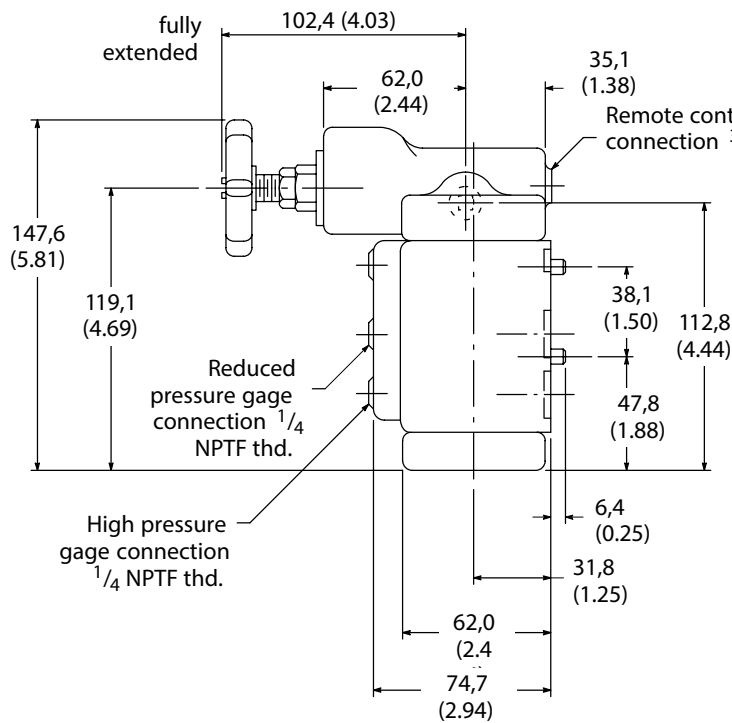
Millimeters (inches)

XGL-03-B-10 Valve



### NOTE

\* Reduced pressure may be adjusted remotely by connecting this port to pressure inlet port of CGR-02-\*-20 valve or C-175-\*-10 valve. Pressure setting of main valve must be higher than that of remote control.

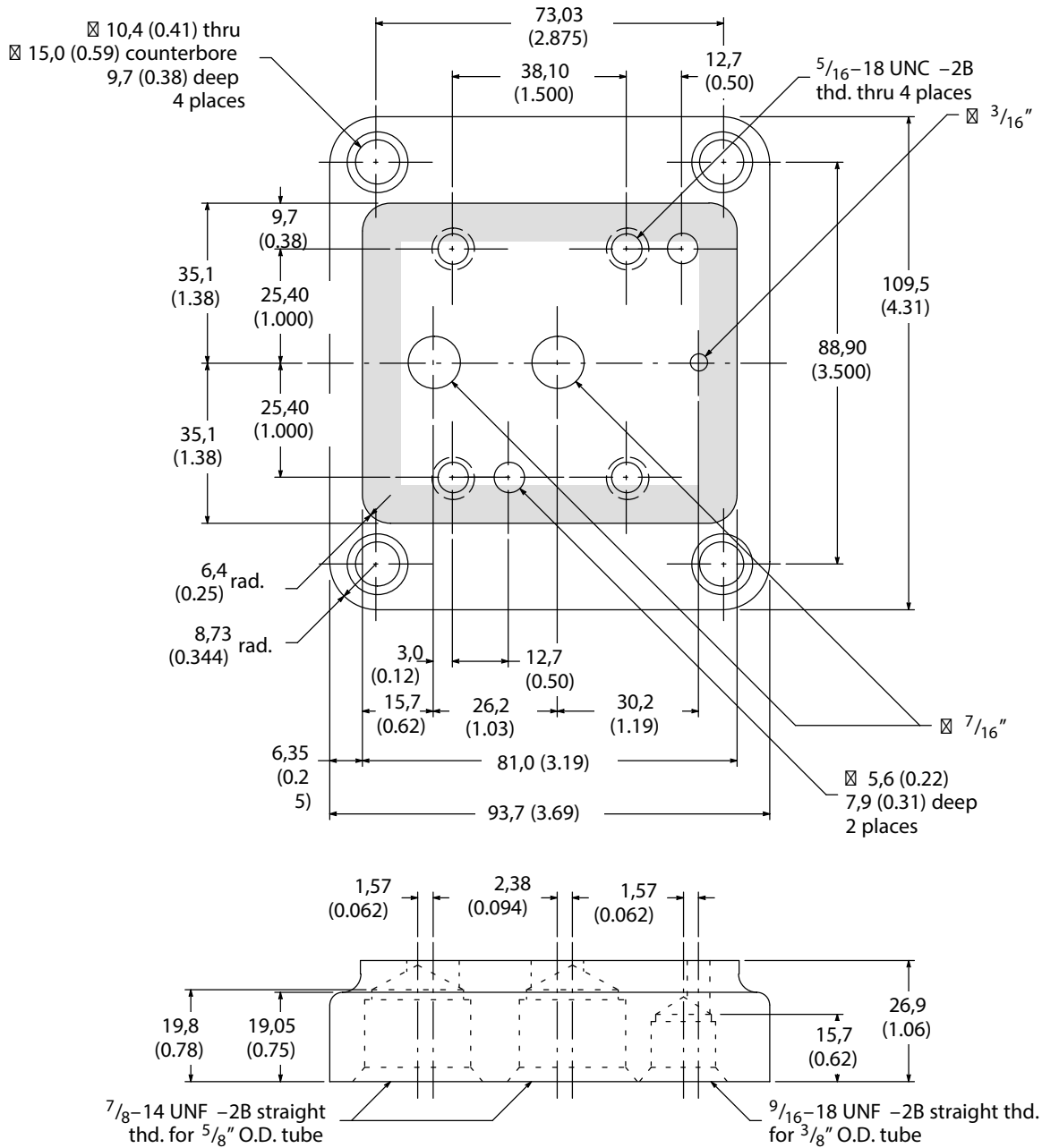




# Series XGL-03 Pressure Reducing Valves

## Mounting Subplate

Model XGLM-10S-03-10



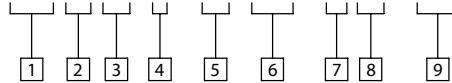
# Series X(C)\*-03/06/10 Pressure Reducing Valves

## Ratings

Rated Capacity (Maximum)	530 l/min (140 USgpm)
Inlet Pressure (Maximum)	210 bar (3000 psi)

## Model Code

**(F3)X(C) \* -(H) 06 - 2 B - 30**



<p><b>1</b> Special seals</p> <p>F3 – For mineral oil and fire resistant fluids Blank – Omit for standard models</p>	<p><b>5</b> High-flow designation</p> <p>H – High-flow valve</p> <table border="1"> <thead> <tr> <th>Size</th> <th>Flow l/min (USgpm)</th> </tr> </thead> <tbody> <tr> <td>03</td> <td>114 (30)</td> </tr> <tr> <td>06</td> <td>265 (70)</td> </tr> <tr> <td>10</td> <td>530 (140)</td> </tr> </tbody> </table> <p>Blank – Omit for 'B' and 'F' models</p>	Size	Flow l/min (USgpm)	03	114 (30)	06	265 (70)	10	530 (140)	<p><b>8</b> Maximum rated flow capacity</p> <table border="1"> <thead> <tr> <th>B*</th> <th>Size</th> <th>Flow l/min (USgpm)</th> </tr> </thead> <tbody> <tr> <td></td> <td>03</td> <td>26,5 (7)</td> </tr> <tr> <td></td> <td>06</td> <td>57 (15)</td> </tr> <tr> <td></td> <td>10</td> <td>189 (50)</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>F</th> <th>Size</th> <th>Flow l/min (USgpm)</th> </tr> </thead> <tbody> <tr> <td></td> <td>03</td> <td>53 (14)</td> </tr> <tr> <td></td> <td>06</td> <td>114 (30)</td> </tr> <tr> <td></td> <td>10</td> <td>284 (75)</td> </tr> </tbody> </table> <p>Blank – Omit for 'H' high-flow models</p> <p>* Not available with '3' maximum adjustable pressure.</p>	B*	Size	Flow l/min (USgpm)		03	26,5 (7)		06	57 (15)		10	189 (50)	F	Size	Flow l/min (USgpm)		03	53 (14)		06	114 (30)		10	284 (75)
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<p><b>2</b> Valve type</p> <p>X – Pressure reducing valve</p>	<p><b>6</b> Valve size</p> <p>03 – 3/8" pipe or 0.7500-16 UNF-2B straight thread (0.500 tubing) 06 – 3/4" pipe or 1.0625-12 UN-2B straight thread (0.750 tubing) 10 – 1 1/4" pipe or 1.6250-12 UN-2B straight thread (1.250 tubing)</p>	<p><b>9</b> Design number</p> <p>Subject to change. Installation dimensions same for designs 30 through 39.</p>																																
<p><b>3</b> Integral check valve</p> <p>C – Reverse free flow check</p>	<p><b>7</b> Maximum adjustable pressure</p> <p>1 – 70 bar (1000 psi) 2 – 140 bar (2000 psi) 3 – 210 bar (3000 psi)*</p> <p>* 10,3 bar (150 psi) pressure drop across valve minimum recommended. Not available with 'B' flow capacity.</p>																																	
<p><b>4</b> Connections</p> <p>G – Manifold or subplate mounting S – SAE straight thread T – NPTF thread*</p> <p>* Not recommended</p>																																		

# Series X(C)\*-03/06/10 Pressure Reducing Valves

## General Data

The operation of these reducing valves is such that reduced outlet pressure remains constant regardless of variation of inlet pressure above the selected pressure setting. Reverse free flow from "reduced pressure outlet" connection to "high pressure inlet" connection is provided by optional integral check valve.

Contact your Vickers by Danfoss representative if maximum inlet pressure is needed with minimum rated reduced pressure.

Adjustment of reduced outlet pressure is accomplished by loosening jam nut and turning pressure adjustment control. Clockwise rotation increases pressure. Counterclockwise rotation decreases

pressure. Control adjustment has stops for minimum and maximum pressures.

## Drain Connection

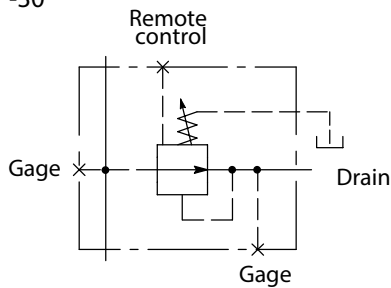
The drain connection must be piped directly to tank through a surge free line. Any continuous drain line pressure must be known and that value added to the valve pressure setting.

## Pressure Adjustment

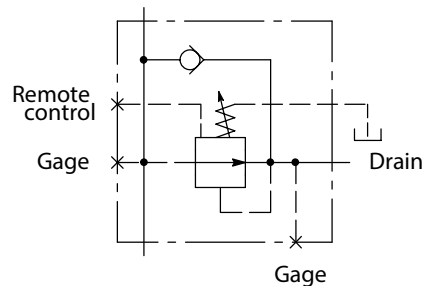
A differential of at least 10,3 bar (150 psi) between inlet and outlet pressure must be maintained for proper functioning.

## Graphical Symbols

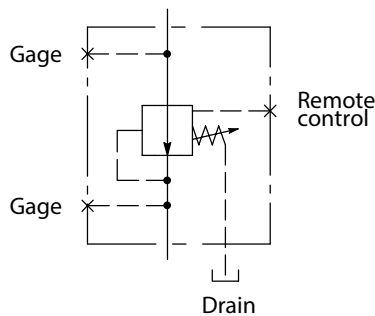
XS-\*\*-\*-30



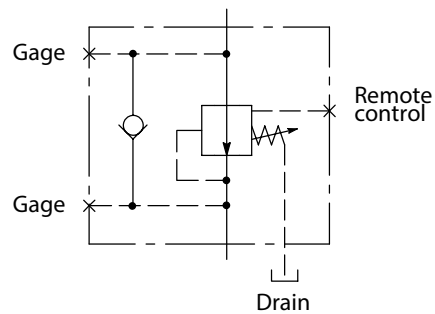
XCS-\*\*-\*-30



XG-\*\*-\*-30



XCG-\*\*-\*-30



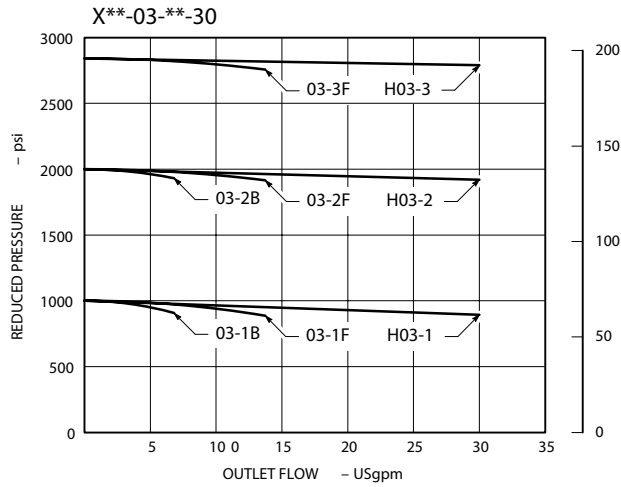
# Series X(C)\*-03/06/10 Pressure Reducing Valves

## Performance Curves

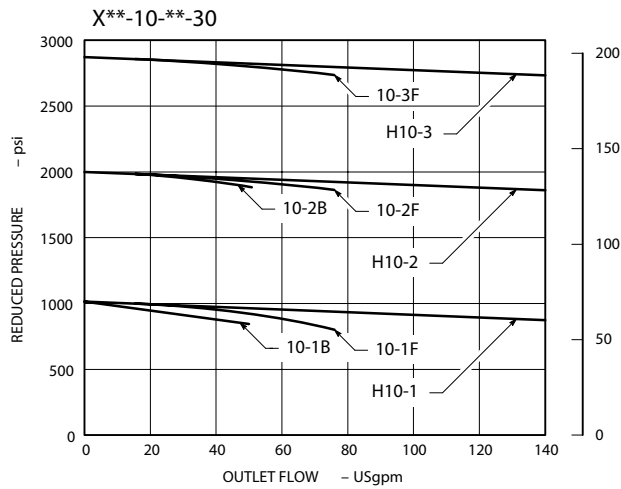
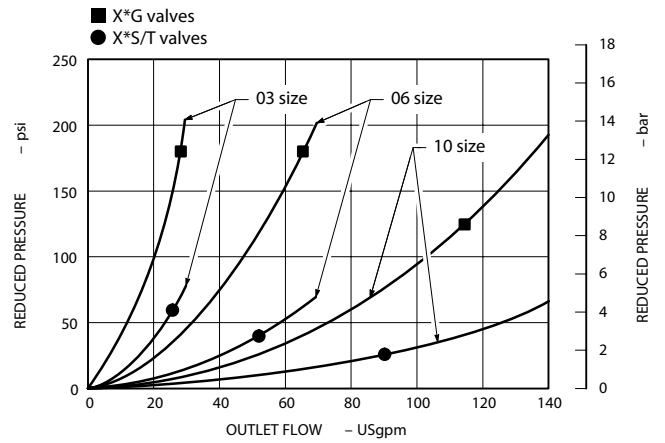
Based on fluid with specific gravity of 0.865 and viscosity of 20 cSt (100 SUS)

### Outlet Pressure vs. Flow

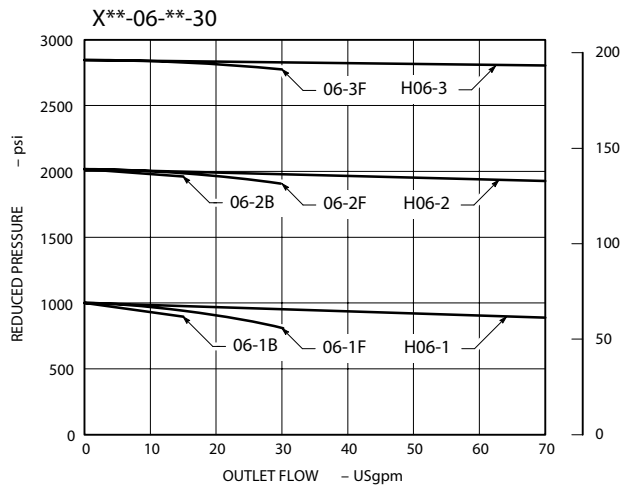
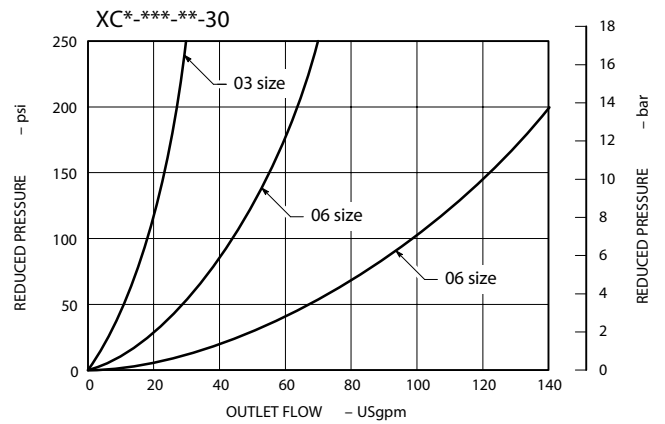
210 bar (3000 psi) inlet



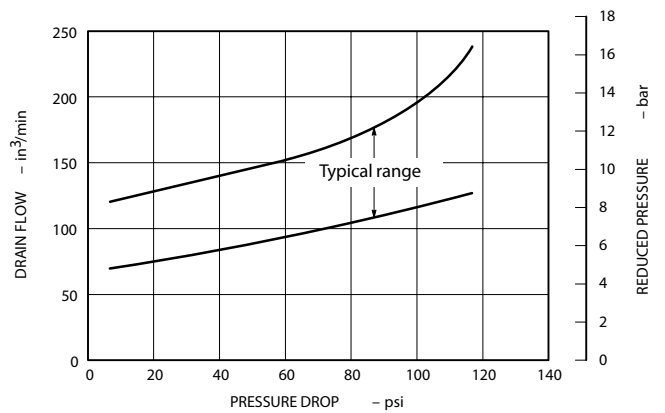
### Valve Pressure Drop vs. Flow



### Check Valve Pressure Drop vs. Reverse Free Flow



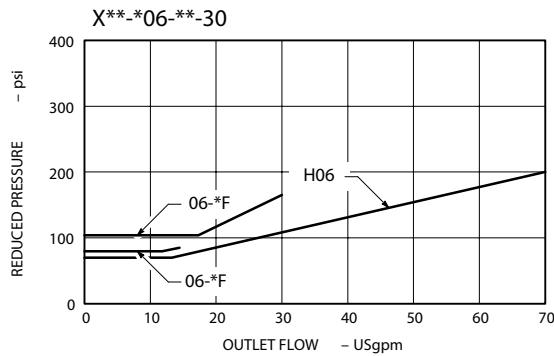
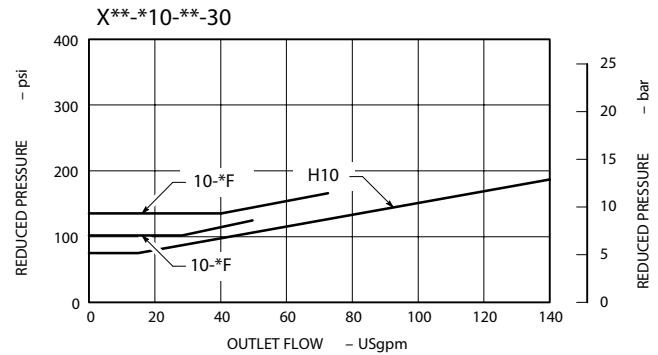
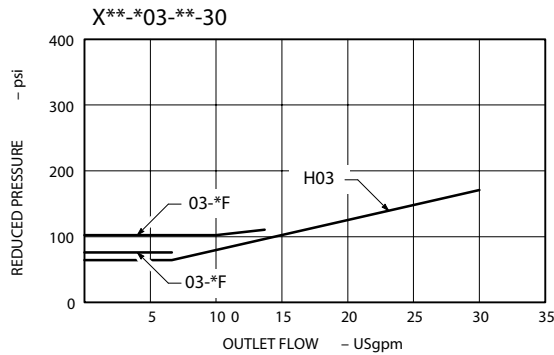
### Drain (Control) Flow vs. Valve Pressure Drop (Inlet - Outlet) at Any Flow Condition



# Series X(C)\*-03/06/10 Pressure Reducing Valves

## Minimum Adjustable Pressure vs. Flow

140 bar (2000 psi) inlet



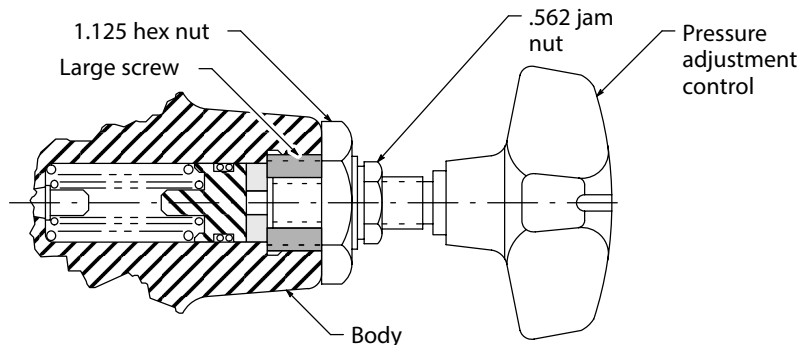
## Valve Pressure Adjustment

Maximum pressure for each specific pressure range is pre-set at the factory with the large screw and held in place by the 1.125 hex nut.

Sensitivities for the different pressure ranges are: a) 185 psi/rev for 1000 psi max. pressure (5.4 turns total); b) 295 psi/rev for 2000 psi max. pressure (6.8 turns total); and c) 485 psi/rev for 3000 psi max. pressure (6.2 turns total). To lower the maximum pressure:

1. Start large screw approximately 2 to 3 turns into body, then assemble 1.125 hex nut, pressure adjustment control, and .562 jam nut.

2. Turn pressure adjustment control all the way in so .562 jam nut and pressure adjustment control head are tight against end of large screw.
  3. With 1.125 hex nut backed-off for clearance, continue turning pressure adjustment control (with large screw locked to it) until desired maximum pressure is reached.
  4. Tighten 1.125 hex nut against body to lock maximum pressure setting in place.
1. Back out pressure adjustment control to desired working pressure and lock in place with .562 jam nut.



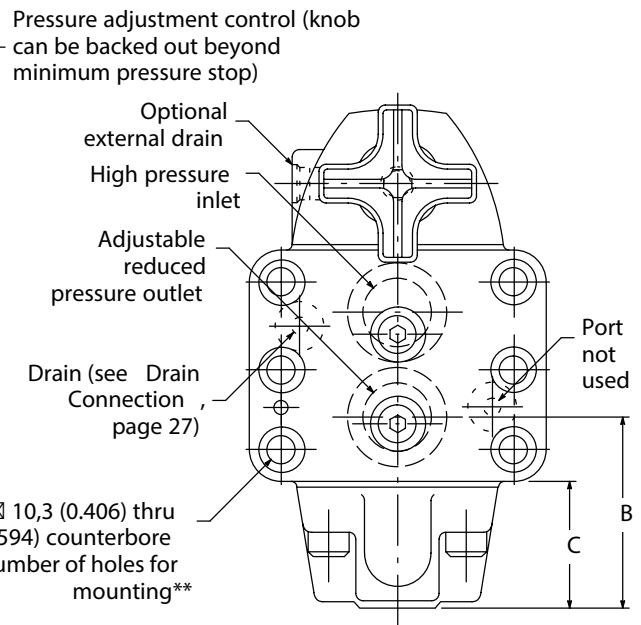
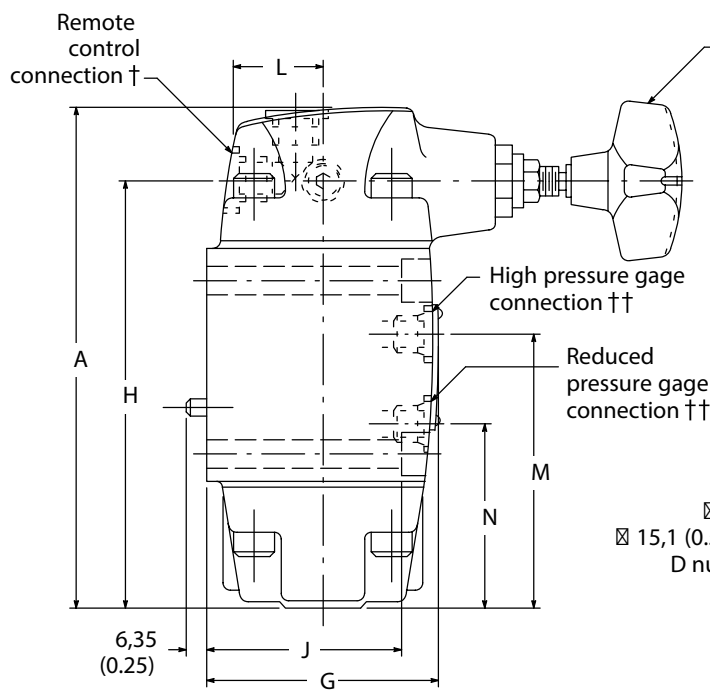
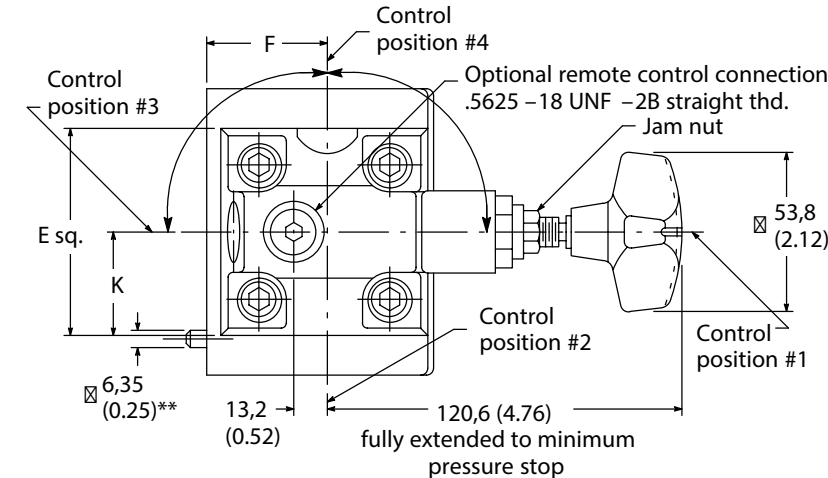
# Series X(C)\*-03/06/10 Pressure Reducing Valves

## Installation Dimensions

Millimeters (inches)

Subplate or Manifold Mounted Models

XG-\*\*-\*-30 Without Check



## NOTES

Optional adjustment control positions obtained by rotating cover assembly. Position #1 is standard. Position #2 cannot be used. Position #3 can be used (if it does not interfere with the manifold) providing that the external drain in the cover is connected.

\* Available with "(H)06" and "(H)10" models only.

\*\* See mounting subplates for locating dimensions.

† .5625-18 UNF-2B straight thread. Reduced pressure may be adjusted remotely by connecting this port to pressure inlet port of CGR-02\*-20 valve or C-175\*-10 valve. Pressure setting of main valve must be higher than that of remote control.

†† .4375-20 UNF-2B straight thread.

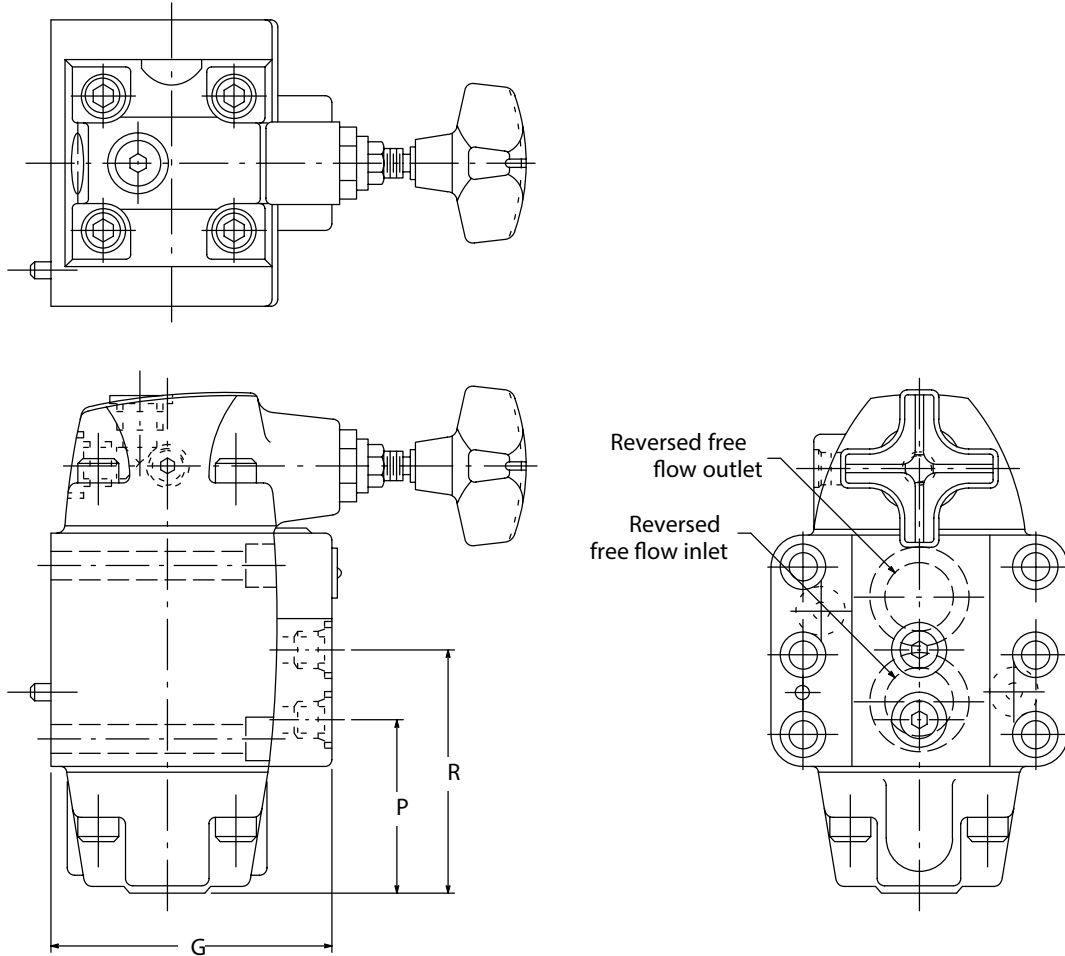
Model	A	B	C	D	E	F	G	H	J	K	L	M	N	NFPA Interface
X(C)G-03*-30	142,2 (5.60)	46,7 (1.84)	29,5 (1.16)	4	57,2 (2.25)	36,6 (1.44)	68,1 (2.68)	116,8 (4.60)	55,9 (2.20)	28,4 (1.12)	24,6 (0.97)	66,0 (2.60)	41,9 (1.65)	P03
X(C)G-06*-30	176,5 (6.95)	66,8 (2.63)	44,7 (1.76)	4	71,4 (2.81)	41,1 (1.62)	79,2 (3.12)	151,1 (5.95)	68,6 (2.70)	35,8 (1.41)	29,5 (1.16)	96,8 (3.81)	65,0 (2.56)	P06
X(C)G-10*-30	211,3 (8.32)	71,4 (2.81)	44,7 (1.76)	6	95,2 (3.75)	50,8 (2.00)	100,1 (3.94)	182,6 (7.19)	90,2 (3.55)	47,8 (1.88)	41,4 (1.63)	101,6 (4.00)	72,4 (2.85)	P10

# Series X(C)\*-03/06/10 Pressure Reducing Valves

Subplate or Manifold Mounted Models (continued)

XCG-\*\*-\*\*-30 With Check

(See previous page for other details and dimensions)

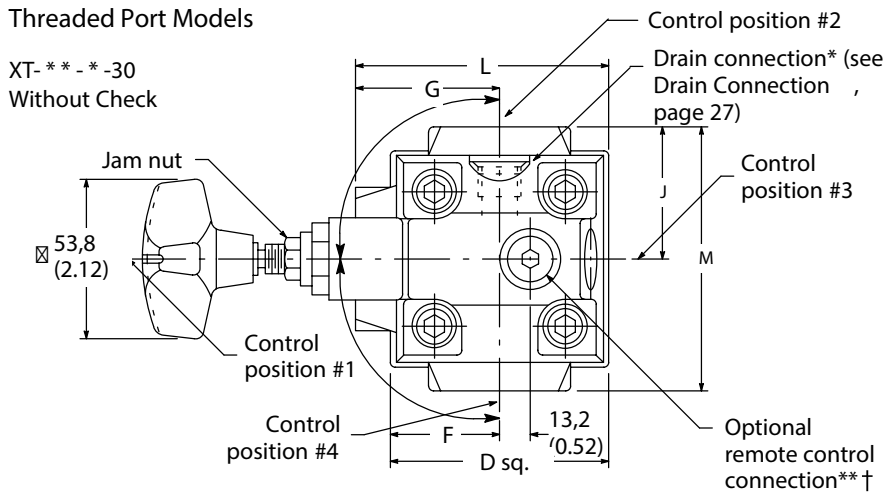


Model	G	P	R
XCG-03*-30	90,4 (3.56)	41,9 (1.65)	66,0 (2.60)
XCG-06*-30	98,6 (3.88)	59,7 (2.35)	85,9 (3.38)
XCG-10*-30	130,3 (5.13)	72,4 (2.85)	101,6 (4.00)

# Series X(C)\*-03/06/10 Pressure Reducing Valves

## Threaded Port Models

XT-\*\*-\*\*-30  
Without Check



### NOTES

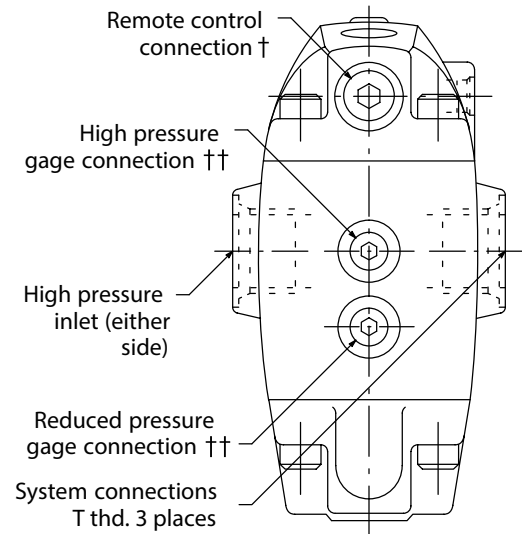
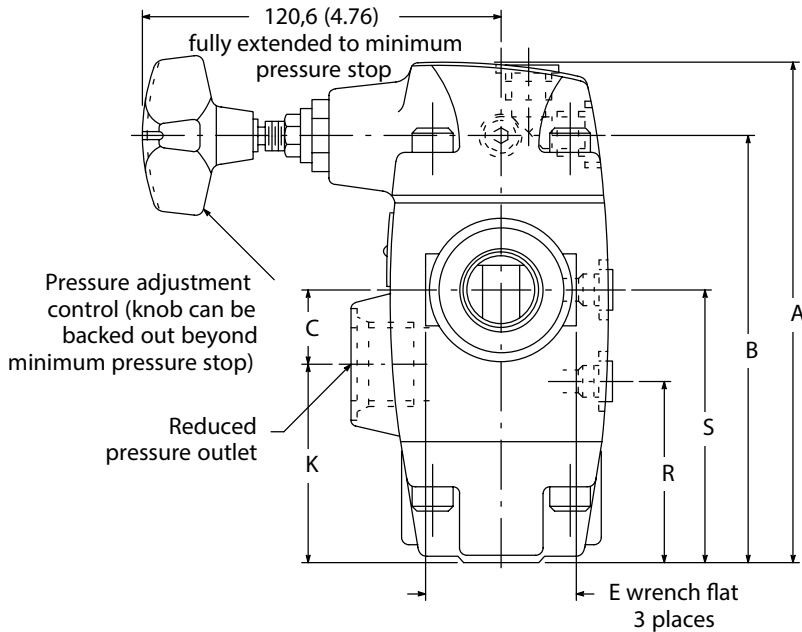
Optional adjustment control positions obtained by rotating cover assembly. Position #1 is standard. Position #2 cannot be used on XS/T-10 models. Position #3 cannot be used.

\* .5625-18 UNF-2B straight thread.

\*\* Available with "(H)06" and "(H)10" models only.

† .5625-18 UNF-2B straight thread. Reduced pressure may be adjusted remotely by connecting this port to pressure inlet port of CGR-02-\*-20 valve or C-175-\*-10 valve. Pressure setting of main valve must be higher than that of remote control.

†† .4375-20 UNF-2B straight thread.



Model	A	B	C	D	E	F	G	H	J
X(C)S/T-03-*-30	142,2 (5.60)	116,8 (4.60)	23,1 (0.91)	59,4 (2.34)	35,1 (1.38)	29,7 (1.17)	39,6 (1.56)	24,6 (0.97)	35,1 (1.38)
X(C)S/T-06-*-30	176,5 (6.95)	151,1 (5.95)	26,9 (1.06)	74,7 (2.94)	50,8 (2.00)	37,3 (1.47)	50,8 (2.00)	29,5 (1.16)	47,8 (1.88)
X(C)S/T-10-*-30	211,3 (8.32)	182,6 (7.19)	28,4 (1.12)	98,6 (3.88)	86,4 (3.40)	49,3 (1.94)	68,3 (2.69)	41,4 (1.63)	53,8 (2.12)

Model	K	L	M	R	S	T – for X(C)S models	T – for X(C)T models
X(C)S/T-03-*-30	46,0 (1.81)	70,9 (2.79)	69,9 (2.75)	41,9 (1.65)	66,0 (2.60)	.7500 – 16 UNF – 2B str thd. (1/2" O.D. tubing)	3/8" NPTF thd. ■
X(C)S/T-06-*-30	69,8 (2.75)	88,1 (3.47)	95,3 (3.75)	65,0 (2.56)	96,8 (3.81)	1.0625 – 12 UNF – 2B str thd. (3/4" O.D. tubing)	3/4" NPTF thd. ■
X(C)S/T-10-*-30	81,0 (3.19)	117,3 (4.62)	108,0 (4.25)	72,4 (2.85)	101,6 (4.00)	1.6250 – 12 UNF – 2B str thd. (1 1/4" O.D. tubing)	1 1/4" NPTF thd. ■

■ Not recommended

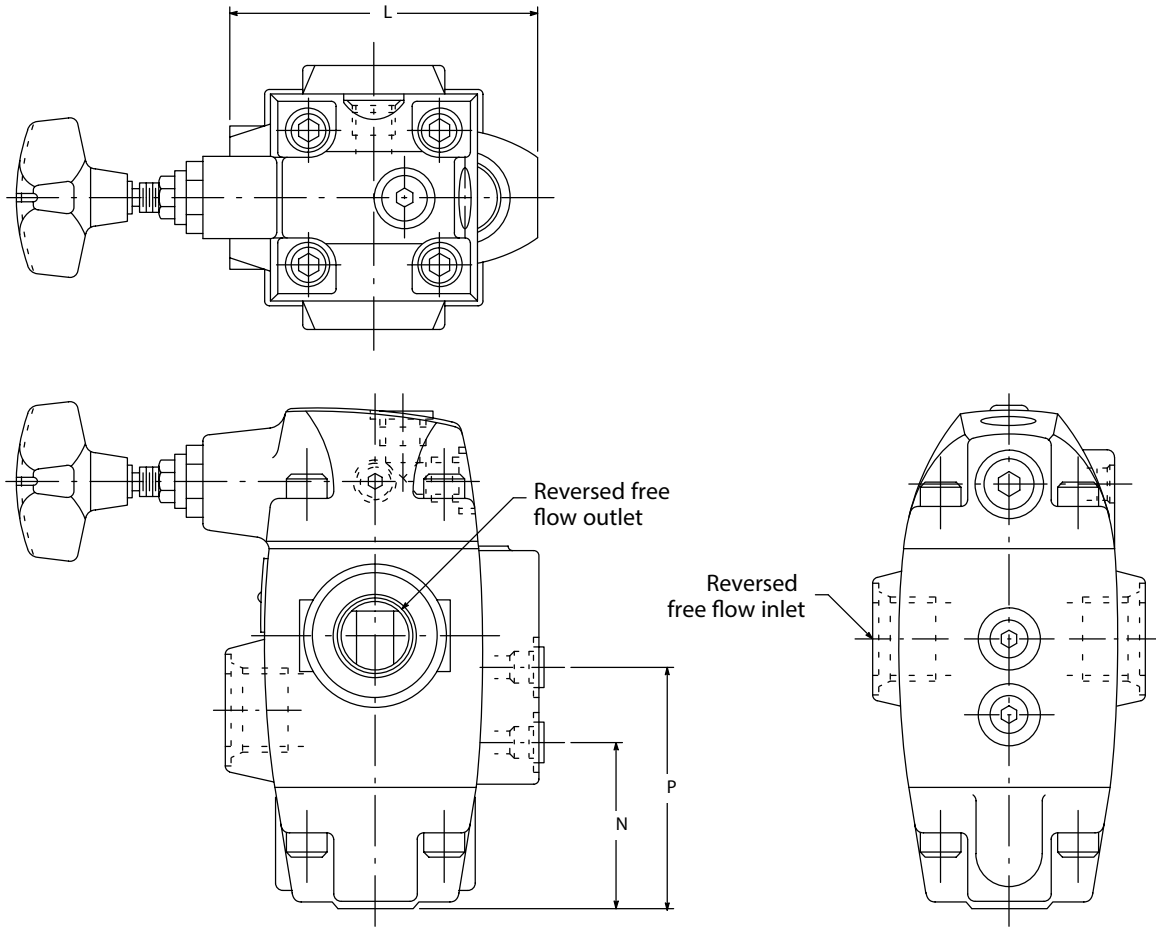


# Series X(C)\*-03/06/10 Pressure Reducing Valves

Threaded Port Models (continued)

XCS/T-\*\*-\*\*-30 With Check

(See previous page for other details and dimensions)

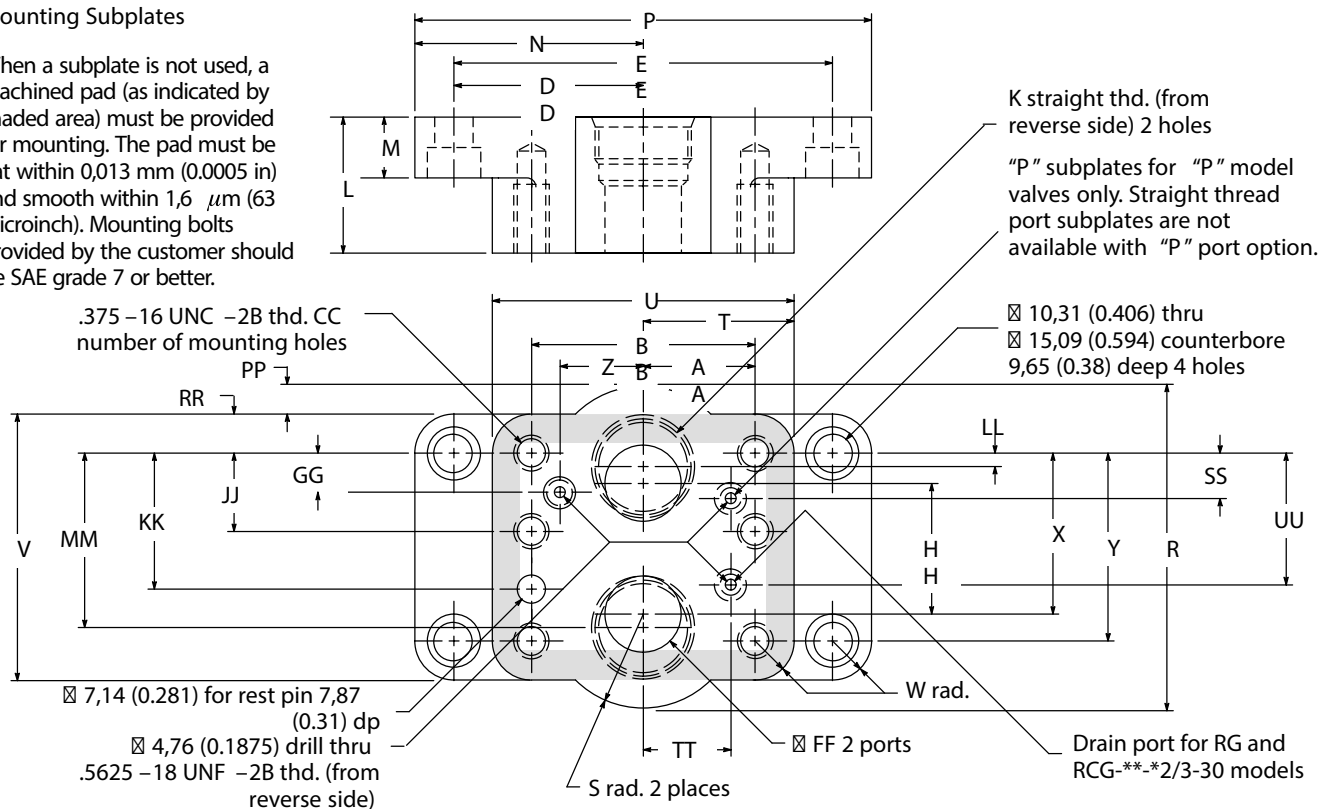


Model	L	N	P
XCS/T-03*-30	93,7 (3.69)	41,9 (1.65)	66,0 (2.60)
XCS/T-06*-30	108,0 (4.25)	59,7 (2.35)	84,6 (3.33)
XCS/T-10*-30	147,6 (5.81)	72,4 (2.85)	101,6 (4.00)

# Series X(C)\*-03/06/10 Pressure Reducing Valves

## Mounting Subplates

When a subplate is not used, a machined pad (as indicated by shaded area) must be provided for mounting. The pad must be flat within 0,013 mm (0.0005 in) and smooth within 1,6  $\mu\text{m}$  (63 microinch). Mounting bolts provided by the customer should be SAE grade 7 or better.



Model	K	Tube O.D.	L	M	N	P	R	S	T	U	V
RXGM-03S-(P)-20	.7500 -16 UNF -2B	1/2"	25,4 (1.00)	19,0 (0.75)	63,5 (2.50)	127,0 (5.00)	76,2 (3.00)	23,9 (0.94)	43,7 (1.72)	87,4 (3.44)	63,5 (2.50)
RXGM-06SX-(P)-20	1.3125 -1 2 UN -2B	1"	31,8 (1.25)	19,0 (0.75)	73,2 (2.88)	146,0 (5.75)	117,3 (4.62)	39,6 (1.56)	50,8 (2.00)	101,6 (4.00)	82,6 (3.25)
RXGM-10S-(P)-30	1.6250 -1 2 UN -2B	1 1/4"	47,8 (1.88)	22,4 (0.88)	79,2 (3.12)	158,8 (6.25)	146,0 (5.75)	47,8 (1.88)	58,7 (2.31)	117,3 (4.62)	104,6 (4.12)

Model	W	X	Y ( $\pm 0,13$ ( $\pm 0,005$ ))	Z	AA	BB	CC	DD	EE ( $\pm 0,13$ ( $\pm 0,005$ ))	FF	GG
RXGM-03S-(P)-20	10,4 (0.41)	35,8 (1.41)	42,87 (1.688)	25,4 (1.00)	33,3 (1.31)	66,5 (2.62)	4	53,1 (2.09)	106,37 (4.188)	14,2 (0.56)	21,3 (0.84)
RXGM-06SX-(P)-20	10,2 (0.44)	49,3 (1.94)	60,32 (2.375)	33,3 (1.31)	39,6 (1.56)	79,2 (3.12)	4	62,0 (2.44)	123,82 (4.875)	23,1 (0.91)	20,6 (0.81)
RXGM-10S-(P)-30	10,4 (0.41)	67,6 (2.66)	84,12 (3.312)	44,4 (1.75)	48,5 (1.91)	96,8 (3.81)	6	69,1 (2.72)	138,12 (5.438)	28,4 (1.12)	24,6 (0.97)

Model	HH	JJ ■	KK	LL	MM	PP	RR	SS	TT	UU	NFPA Interface
RXGM-03S-(P)-20	28,4 (1.12)	—	31,8 (1.25)	4,8 (0.19)	38,1 (1.50)	6,4 (0.25)	10,4 (0.41)	—	25,4 (1.00)	21,3 (0.84)	P03
RXGM-06SX-(P)-20	38,1 (1.50)	—	44,4 (1.75)	6,4 (0.25)	53,8 (2.12)	17,5 (0.69)	11,2 (0.44)	16,8 (0.66)	33,3 (1.31)	39,6 (1.56)	P06
RXGM-10S-(P)-30	50,8 (2.00)	42,2 (1.66)	62,7 (2.47)	7,9 (0.31)	76,2 (3.00)	20,6 (0.81)	10,4 (0.41)	24,6 (0.97)	44,4 (1.75)	59,4 (2.34)	P10

■ RXGM-03S/06SX require 4 valve mounting screws. RXGM-10S requires 6 valve mounting screws.

# Application Data

## Weights

The following table lists the approximate weight of each valve in the catalog:

Valve	Weight kg (lbs)
RS/T-03-*-30	2,7 (6.0)
RS/T-06-*-30	5,7 (12.5)
RS/T-10/12-*-30	12,0 (26.5)
RCS/T-03-*-30	2,9 (6.5)
RCS/T-06-*-30	5,9 (13.0)
RCS/T-10/12-*-30	12,9 (28.5)
RG-03-*-30	3,6 (8.0)
RG-06-*-30	6,4 (14.0)
RG-10/12-*-30	11,8 (26.0)
RCG-03-*-30	3,9 (8.5)
RCG-06-*-30	6,6 (14.5)
RCG-10/12-*-30	12,7 (28.0)
URT*-06-*-10	4,5 (10.0)
URT*-10-*-10	9,1 (20.0)
URG*-06-*-10	11,3 (25.0)
URG*-10-*-10	22,0 (48.5)
XS/TL-03-B-10	4,1 (9.0)
XGL-03-B-10	4,1 (9.0)
XG-03-*-30	3,9 (8.5)
XG-06-*-30	6,1 (13.5)
XG-10-*-30	11,8 (26.0)
XCG-03-*-30	4,1 (9.0)
XCG-06-*-30	6,4 (14.0)
XCG-10-*-30	12,2 (27.0)
XS/T-03-*-30	3,2 (7.0)
XS/T-06-*-30	5,7 (12.5)
XS/T-10-*-30	11,3 (25.0)
XCS/T-03-*-30	3,4 (7.5)
XCS/T-06-*-30	5,9 (13.0)
XCS/T-10-*-30	11,8 (26.0)

The following table lists the approximate weight of each subplate in the catalog:

Subplate	Weight kg (lbs)
RXGM-03S-20	1,5 (3.25)
RXGM-06SX-20	2,9 (6.50)
RXGM-10S-30	5,0 (11.00)
URG1M-06-10	5,7 (12.5)
URG1M-10-10	9,3 (20.5)
XGLM-10S-03-10	1,4 (3.0)

## Fluids and Seals

For best results, oil viscosity should range between 32 cSt and 49 cSt (150 SUS and 225 SUS) at 38 °C (100 °F) with a maximum operating temperature of 68°C (155 °F). Water glycol, water-in-oil emulsions, and petroleum oil may be used with non-F3 models, which are furnished with Buna-N seals for the mounting surface and fluorocarbon seals internally. Add F3 prefix when phosphate ester type fluids or blends are to be used. Refer to 694 for hydraulic fluid and temperature recommendations.

The use of synthetic, fire-resistant fluids requires a valve with special seals.

## Subplates and Bolt Kits

Valves, subplates, and mounting bolts must be ordered separately.

Example:

- (1) URG\*-06-12 valve
- (1) URG1M-06-10 subplate
- (1) BKUR06682 bolt kit (consisting of two bolts,  $\frac{5}{8}$ -11 x 2.50 ", and four bolts,  $\frac{5}{8}$ -11 x 5.25 ")

The following table lists the appropriate subplate for use with each manifold or subplate mounted valve in the catalog:

Valve	Subplate
RG-03-*-30	RXGM-03S-20
RG-06-*-30	RXGM-06SX-20
RG-10/12-*-30	RXGM-10S-30
RCG-03-*-30	RXGM-03S-20
RCG-06-*-30	RXGM-06SX-20
RCG-10/12-*-30	RXGM-10S-30
URG*-06-*-10	URG1M-06-10
URG*-10-*-10	URG1M-10-10
XGL-03-B-10	XGLM-10S-03-10
XG-03-*-30	RXGM-03S-20
XG-06-*-30	RXGM-06SX-20
XG-10-*-30	RXGM-10S-30
XCG-03-*-30	RXGM-03S-20
XCG-06-*-30	RXGM-06SX-20
XCG-10-*-30	RXGM-10S-30

The following table lists the appropriate bolt kit for each subplate mounted valve in the catalog:

Valve	Bolt Kit
R(C)G-03-*-30	BKRX03660
R(C)G-06-*-30	BKRX06661
R(C)G-10-*-30	BKRX10662
URG*-06-*-10	BKUR06682
URG*-10-*-10	BKUR10683
XGL-03-B-10	BKXL03663
X(C)G-03-*-30	BKRX03660
X(C)G-06-*-30	BKRX06661
X(C)G-10-*-30	BKRX10662

When a subplate is not used, a machined pad (as indicated by shaded area on subplate installation dimensions pages) must be provided for mounting. The pad must be flat within 0,013 mm (0.0005 in) and smooth within 1,6 μm (63 microinch). Mounting bolts provided by the customer should be SAE grade 7 or better.

# Application Data

## Fluid Cleanliness

Proper fluid condition is essential for long and satisfactory life of hydraulic components and systems. Hydraulic fluid must have the correct balance of cleanliness, materials, and additives for protection against wear of components, elevated viscosity, and inclusion of air.

Essential information on the correct methods for treating hydraulic fluid is included in Vickers by Danfoss publication "561 Vickers Guide to Systemic Contamination Control " available from your local Vickers by Danfoss distributor or by

contacting Danfoss, Incorporated. Recommendations on filtration and the selection of products to control fluid condition are included in 561.

Recommended cleanliness levels, using petroleum oil under common conditions, are based on the highest fluid pressure levels in the system and are coded in the chart below. Fluids other than petroleum, severe service cycles, or temperature extremes are cause for adjustment of these cleanliness codes. See Vickers by Danfoss publication 561 for exact details.

Danfoss products, as any components, will operate with apparent satisfaction in fluids with higher cleanliness codes than those described. Other manufacturers will often recommend levels above those specified. Experience has shown, however, that life of any hydraulic component is shortened in fluids with higher cleanliness codes than those listed below. These codes have been proven to provide a long, trouble-free service life for the products shown, regardless of the manufacturer.

Product	System Pressure Level bar (psi)		
	<70 (<1000)	70-207 (1000-3000)	207+ (3000+)
Vane Pumps – Fixed	20/18/15	19/17/14	18/16/13
Vane Pumps – Variable	18/16/14	17/15/13	
Piston Pumps – Fixed	19/17/15	18/16/14	17/15/13
Piston Pumps – Variable	18/16/14	17/15/13	16/14/12
Directional Valves	20/18/15	20/18/15	19/17/14
Pressure/Flow Control Valves	19/17/14	19/17/14	19/17/14
CMX Valves	18/16/14	18/16/14	17/15/13
Servo Valves	16/14/11	16/14/11	15/13/10
Proportional Valves	17/15/12	17/15/12	15/13/11
Cylinders	20/18/15	20/18/15	20/18/15
Vane Motors	20/18/15	19/17/14	18/16/13
Axial Piston Motors	19/17/14	18/16/13	17/15/12
Radial Piston Motors	20/18/14	19/17/13	18/16/13

### Products we offer:

- Cartridge valves
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- Electric converters
- Electric machines
- Electric motors
- Gear motors
- Gear pumps
- Hydraulic integrated circuits (HICs)
- Hydrostatic motors
- Hydrostatic pumps
- Orbital motors
- PLUS+1® controllers
- PLUS+1® displays
- PLUS+1® joysticks and pedals
- PLUS+1® operator interfaces
- PLUS+1® sensors
- PLUS+1® software
- PLUS+1® software services, support and training
- Position controls and sensors
- PVG proportional valves
- Steering components and systems
- Telematics

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