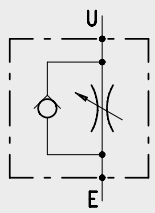




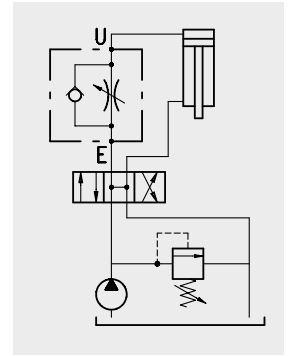
# Needle valves

## Index

Hydraulic diagram	Type	Description	Maximum flow up to		Maximum pressure		Page
			l/min	US gpm	bar	psi	
	VSRU	Adjustable, variable reverse flow, single acting, ball type	150	40	450	6500	19
	VSRU/FF../P. VL		60	16	350	5100	
	VSRU/C	Adjustable, variable reverse flow, single acting, poppet type	250	66	450	6500	
	NT..A	Adjustable, variable reverse flow, single acting	60	16	350	5100	

**Operation**

The oil flow is free from U (A) to E (A1) and capacity is adjusted during reverse flow by variation of the oil flow section.  
For cartridges the ports are 1 and 2. 1 coincides with port E and 2 coincides with port U.



**Performance**

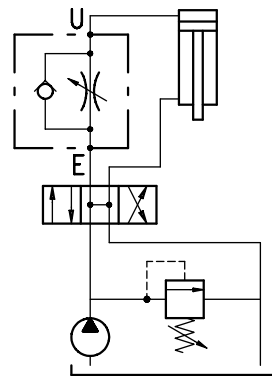
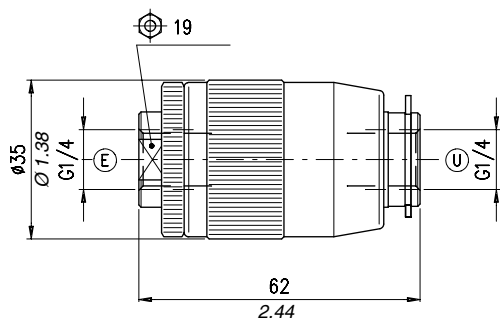
**Body Valves**

Type	Max. flow		Max. pressure		Opening pressure between U (A) and E (A1)	Weight	
	l/min	US gpm	bar	psi		kg	lb
VSRU 14	25	6.6	450	6500	see performance graphs	0,31	0.68
VSRU 38	40	11	400	5800		0,52	1.15
VSRU 18							
VSRU 12	60	16	350	5100		0,75	2.20
VSRU 34	100	26	300	4350		1,18	2.60
VSRU 100	150	40	250	3600		1,95	4.30
VSRU/C 14	25	6.6	450	6500		0,32	0.70
VSRU/C 38	40	11	400	5800		0,52	1.15
VSRU/C 18							
VSRU/C 12	60	16	350	5100		0,75	2.20
VSRU/C 34	100	26	300	4350		1,19	2.62
VSRU/C 100	150	40	250	3600		1,95	4.30
VSRU/C 114	250	66	250	3600		3,12	6.88
VSRU/FF/14/P.VL	25	6.6	350	5100		0,27	0.59
VSRU/FF/38/P.VL	40	11				0,45	0.99
VSRU/FF/12/P.VL	60	16				0,74	1.63

**Cartridges**

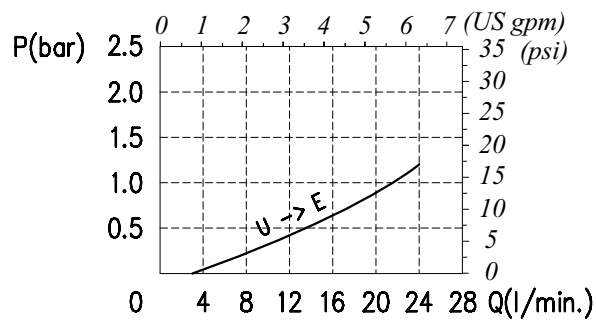
Tipo	Max flow		Max. pressure		Opening pressure from 2 to 1 with closed regulator	Cavities and tools	Weight	
	l/min	US gpm	bar	US gpm			kg	lb
NT08A	15	3.9	350	5100	see performance graphs	see cavity SAE 8-2 page 45	0,24	0.53
NT10A	30	7.9				see cavity SAE 10-2 page 45	0,29	0.64
NT12A	60	16				see cavity SAE 12-2 page 45	0,40	0.88

## Dimensions and hydraulic circuit



## Rating diagrams

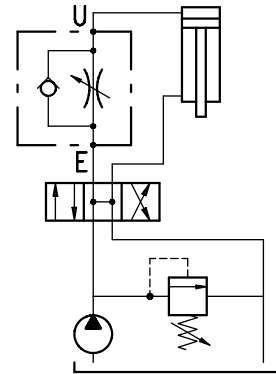
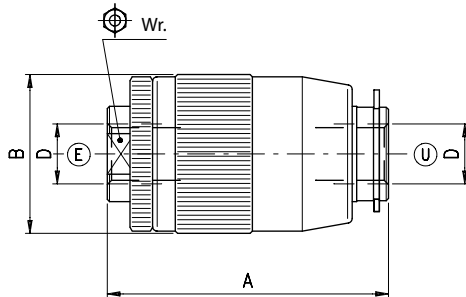
Typical pressure drop vs. flow characteristics



## Order code

VSRU 14

**Dimensions and hydraulic circuit**

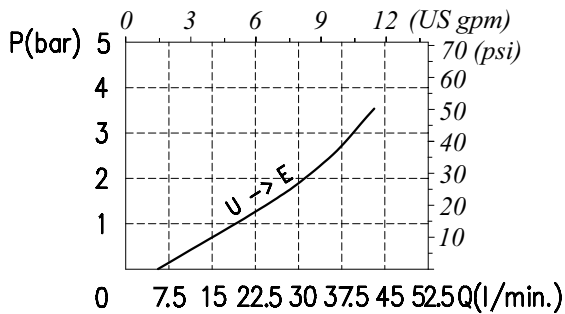


VSRU	D	A	B	Wr.
38	G 3/8	72 - 2.83	42 - 1.65	24 - 0.94
18	M18x1.5	72 - 2.83	42 - 1.65	24 - 0.94
12	G 1/2	80 - 3.15	48 - 1.89	30 - 1.18

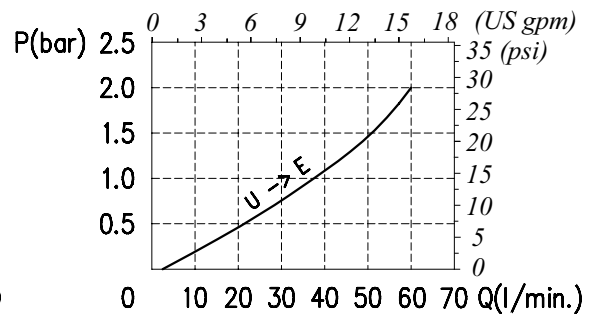
dimensions are in mm-in

**Rating diagrams**

Typical pressure drop vs. flow characteristics  
VSRU 38 - 18



Typical pressure drop vs. flow characteristics  
VSRU 12



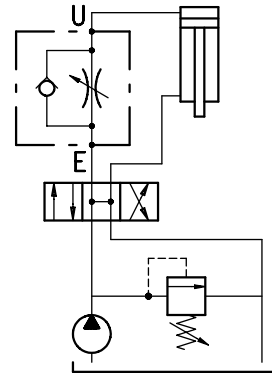
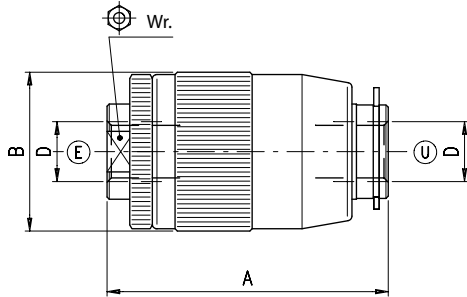
**Order code**

**VSRU □□**

Port size

- 38) G 3/8
- 18) M18x1,5
- 12) G 1/2

## Dimensions and hydraulic circuit



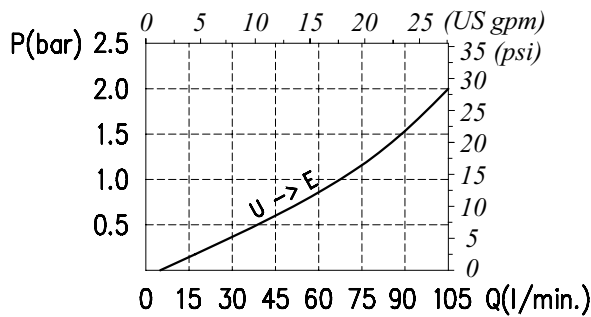
VSRU	D	A	B	Wr.
34	G 3/4	100 - 3.94	55 - 2.16	36 - 1.42
100	G 1"	122 - 4.80	65 - 2.56	41 - 1.61

dimensions are in mm-in

## Rating diagrams

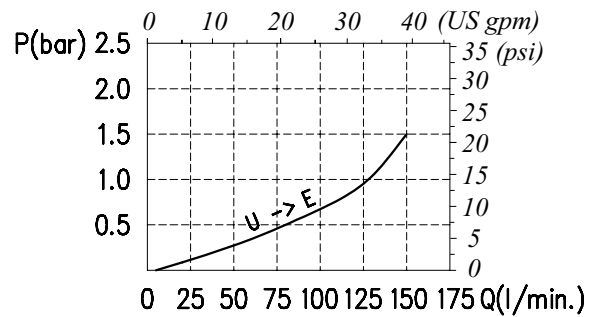
Typical pressure drop vs. flow characteristics

VSRU 34



Typical pressure drop vs. flow characteristics

VSRU 100



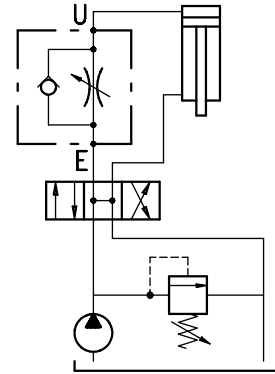
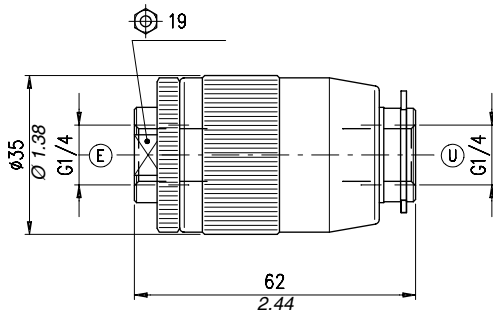
## Order code

VSRU □□

Port size

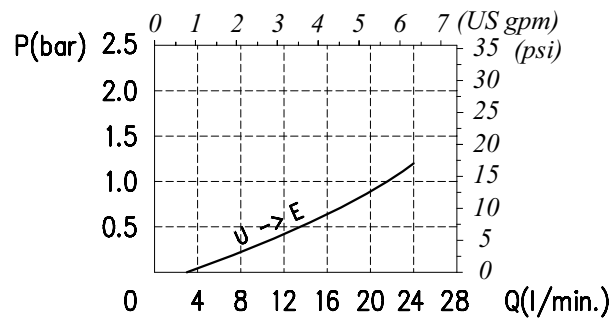
34) G 3/4  
100) G 1

**Dimensions and hydraulic circuit**



**Rating diagrams**

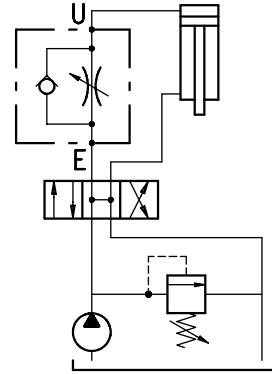
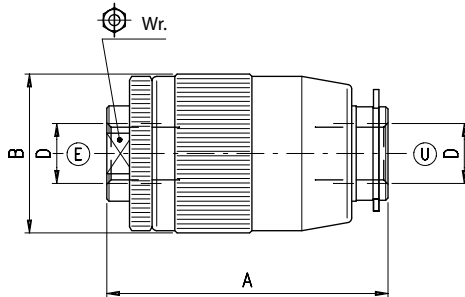
Typical pressure drop vs. flow characteristics



**Order code**

**VSRU/C 14**

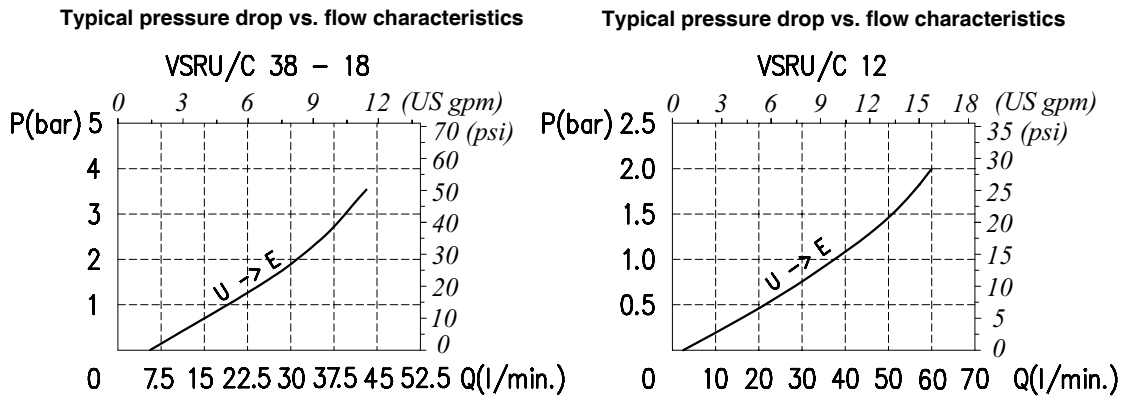
## Dimensions and hydraulic circuit



VSRU/C	D	A	B	Wr.
38	G 3/8	72-2.83	42-1.65	24-0.94
18	M18x1.5	72-2.83	42-1.65	24-0.94
12	G 1/2	80-3.15	48-1.89	30-1.18

dimensions are in mm-in

## Rating diagrams



## Order code

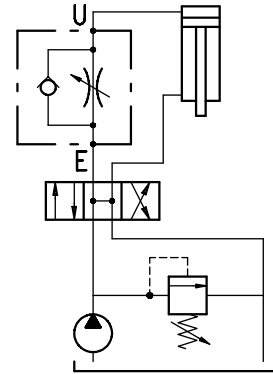
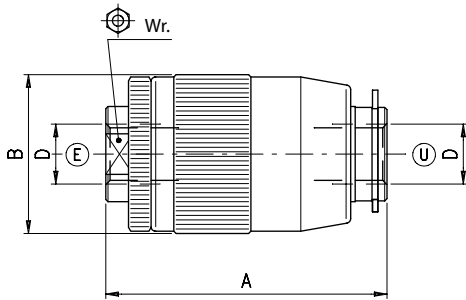
VSRU /C □□

Port size

- 38) G 3/8
- 18) M18x1,5
- 12) G 1/2



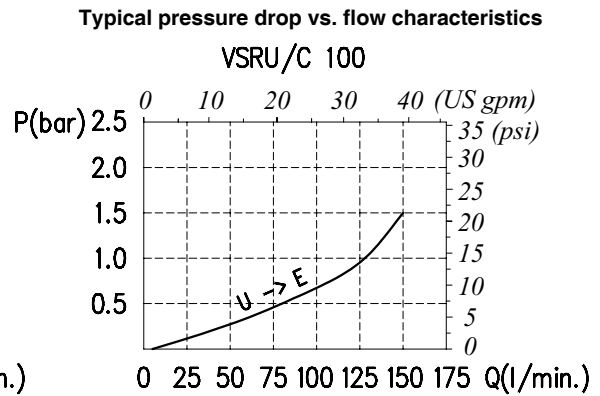
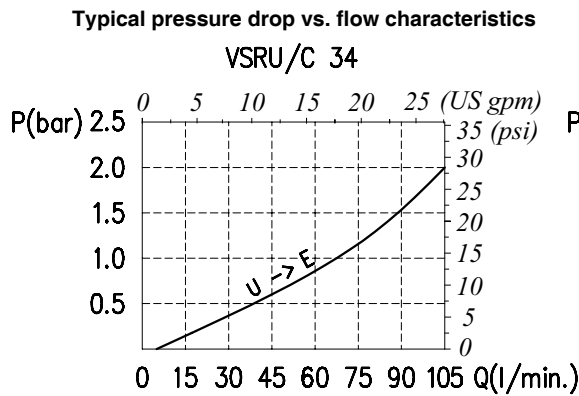
**Dimensions and hydraulic circuit**



VSRU/C	D	A	B	Wr.
34	G 3/4	100- 3.94	55- 2.16	36- 1.42
100	G 1"	122- 4.80	65- 2.56	41- 1.61

dimensions are in mm-in

**Rating diagrams**



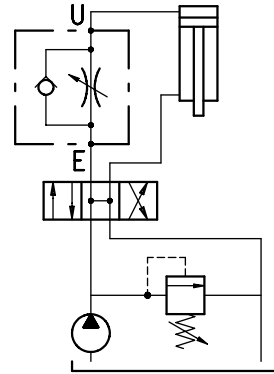
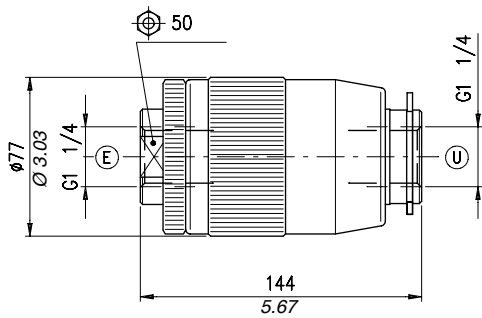
**Order code**

VSRU /C □□

Port size

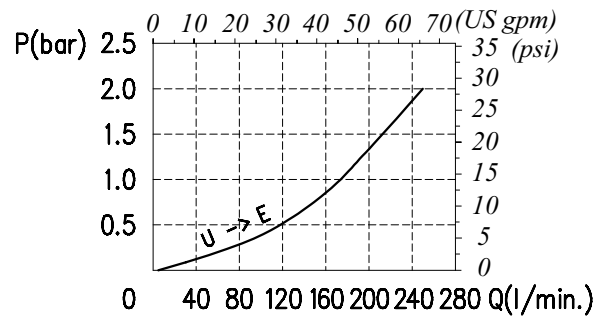
- 34) G 3/4
- 100) G 1

## Dimensions and hydraulic circuit



## Rating diagrams

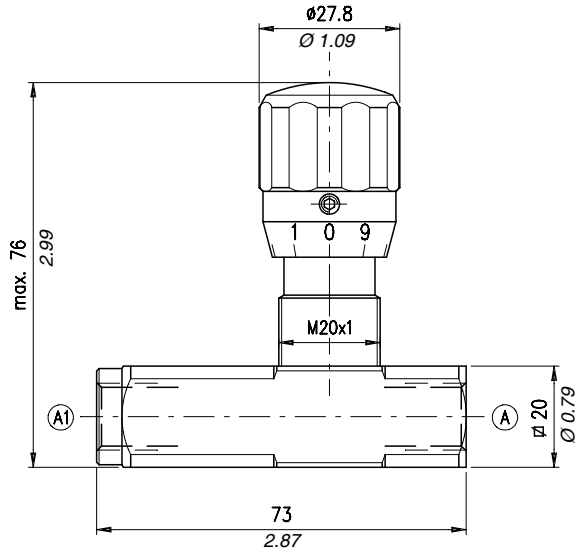
Typical pressure drop vs. flow characteristics



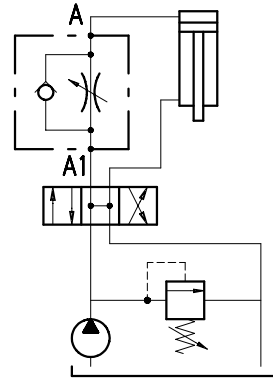
## Order code

VSRU C/114

**Dimensions and hydraulic circuit**

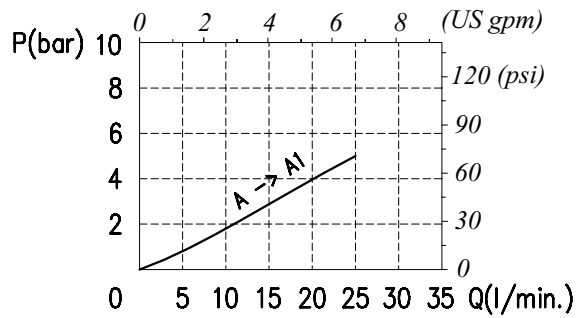


A-A1
G 1/4



**Rating diagrams**

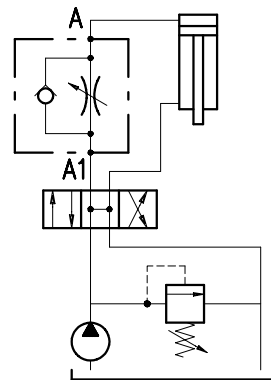
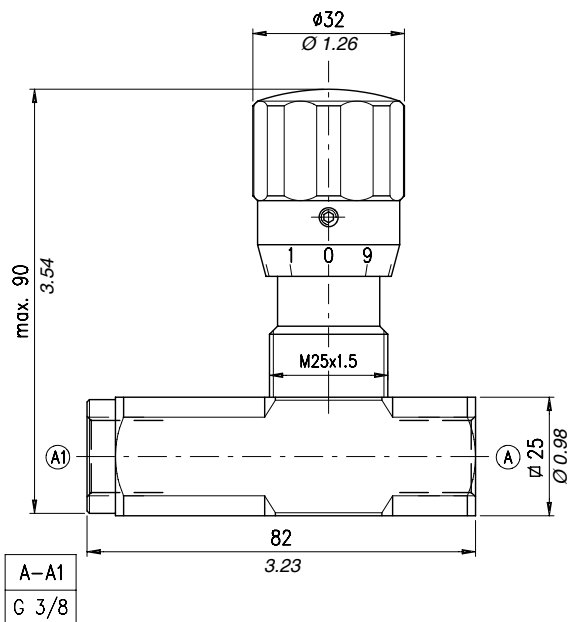
Typical pressure drop vs. flow characteristics  
With A1 → A fully closed



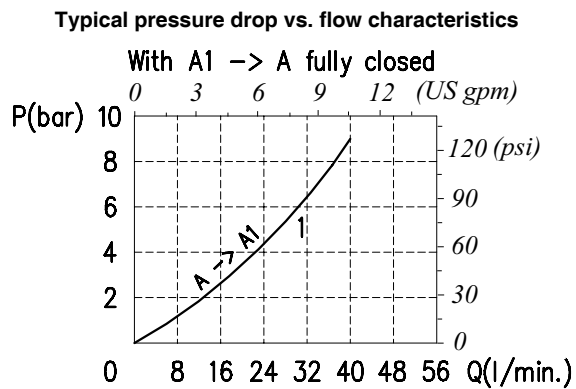
**Order code**

**VSRU/FF/14/P.VL**

## Dimensions and hydraulic circuit



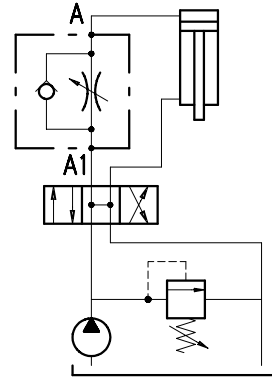
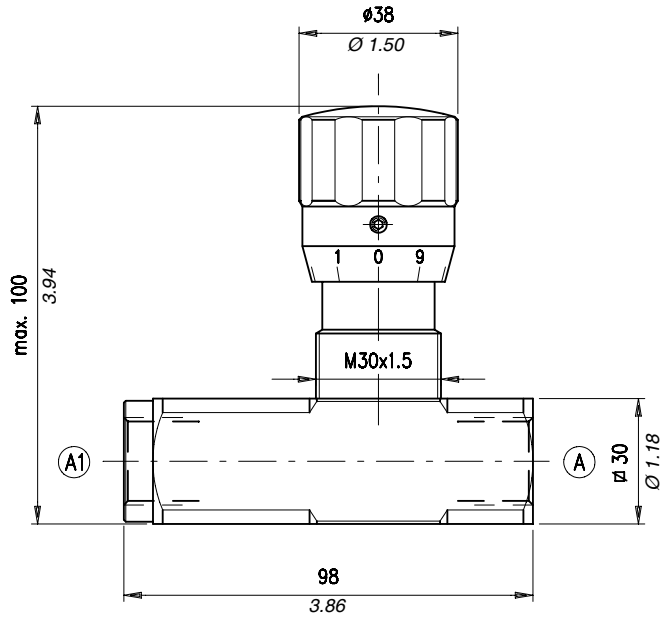
## Rating diagrams



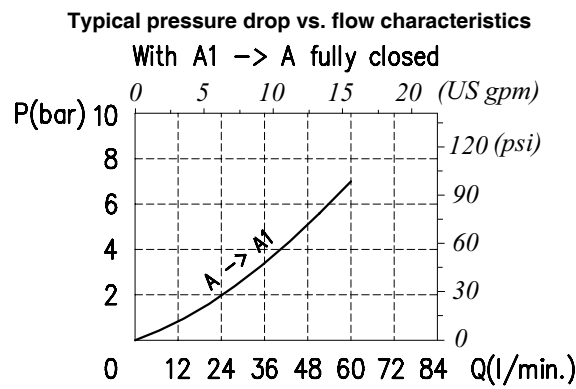
## Order code

VSRU /FF /38 /P .VL

**Dimensions and hydraulic circuit**



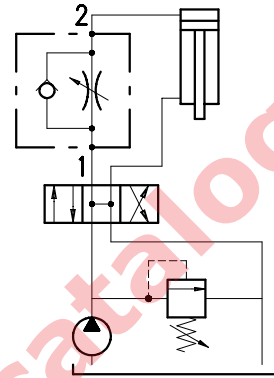
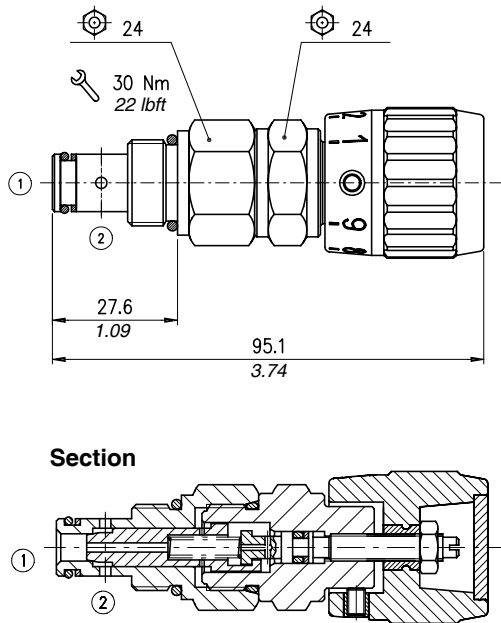
**Rating diagrams**



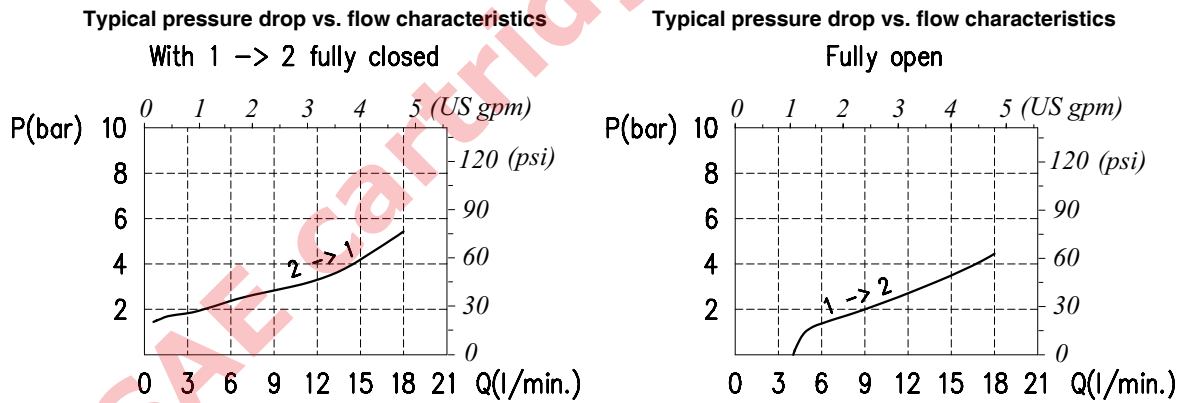
**Order code**

**VSRU /FF /12 /P .VL**

## Dimensions and hydraulic circuit



## Rating diagrams



## Order code

NT08A / A - □ - □ - □

**Adjustments**  
(see page 38)

**S** (screw)  
**M** (copped adjustment)  
**W** (handknob calibrated)

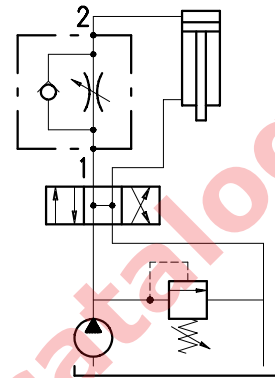
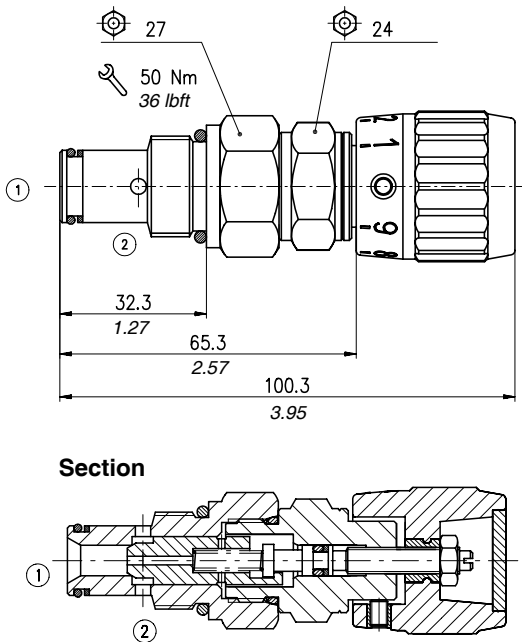
**Opening pressure check valve from 1 to 2**

**1)** 0,5 bar (7.3 psi)

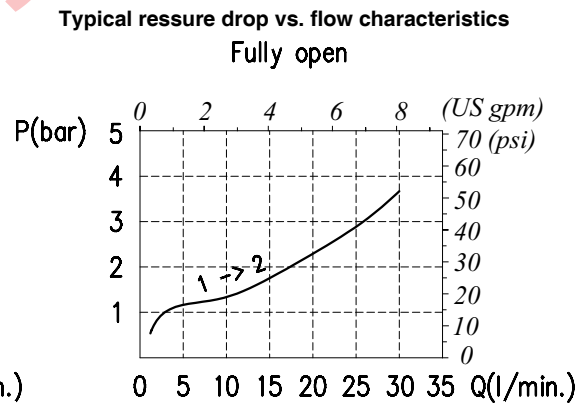
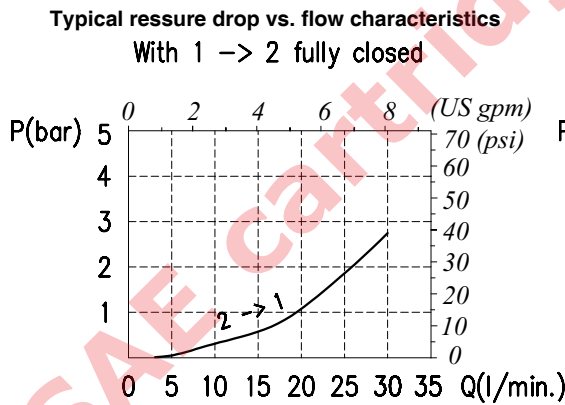
**Seals**

**B)** Buna  
**V)** Viton

**Dimensions and hydraulic circuit**



**Rating diagrams**



**Order code**

**NT10A / A - □ - □ - □**

**Adjustments**  
(see page 38)

- S** (screw)
- M** (copped adjustment)
- W** (handknob calibrated)

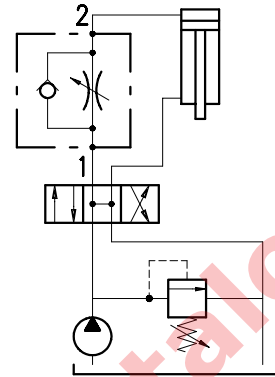
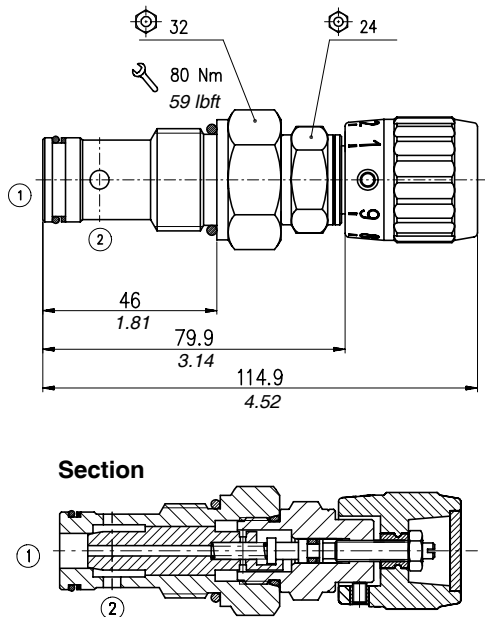
**Opening pressure check  
valve from 1 to 2**

1) 0,5 bar (7.3 psi)

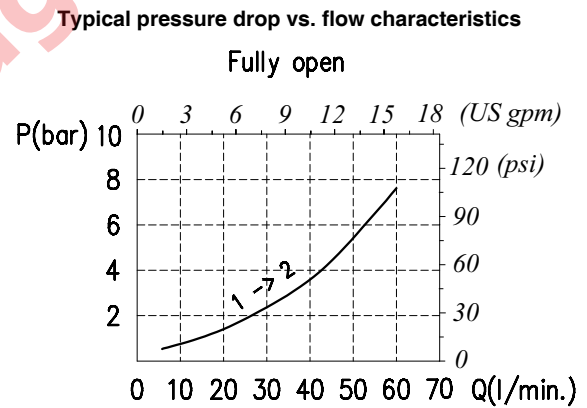
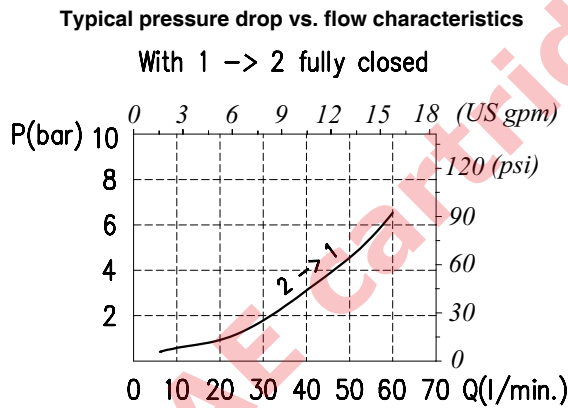
**Seals**

- B**) Buna
- V**) Viton

## Dimensions and hydraulic circuit



## Rating diagrams



## Order code

NT12A / A - □ - □ - □

**Adjustments**  
(see page 38)

**S** (screw)  
**M** (copped adjustment)  
**W** (handknob calibrated)

**Opening pressure check valve from 1 to 2**

1) 0,5 bar (7.3 psi)

**Seals**

**B**) Buna  
**V**) Viton

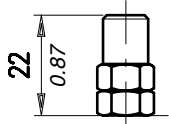
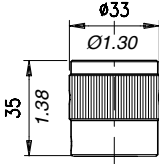
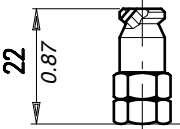


# Adjustments

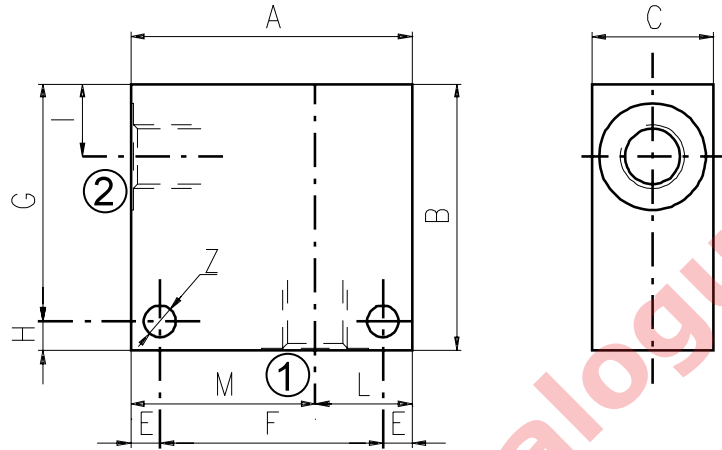
## Operation

This chapter show main adjusting devices for the valves listed in this catalog. These regulations are used to adjust flow rate between inlet and working ports.

## Performance

	<p><b>Screw "S"</b></p>		<p><b>Handknob calibrated "M"</b></p>
	<p><b>Copped adjustment "W"</b></p>		

Material	Max. pressure	
	bar	psi
Aluminium	210	3050
Steel	350	5100



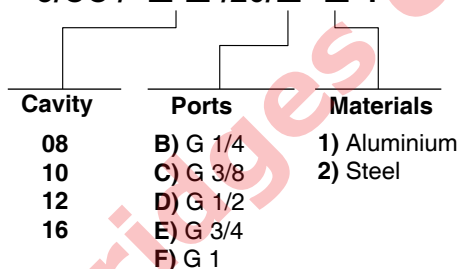
Cavity	Ports		A	B	C	E	F	G	H	I	L	M	Z
SAE 8/2	G 1/2	mm	70	65	35	7	56	53	12	14,5	35	35	6,5
		in	2.75	2.56	1.38	0.27	2.20	2.09	0.47	0.57	1.38	1.38	0.25
	G 1/4	mm	50	50	30	6	38	44	6	14,8	20	30	6,5
		in	1.97	1.97	1.18	0.24	1.50	1.73	0.24	0.58	0.79	1.18	0.25
	G 3/8	mm	50	50	30	6	38	44	6	14,8	20	30	6,5
		in	1.97	1.97	1.18	0.24	1.50	1.73	0.24	0.58	0.79	1.18	0.25
SAE6	mm	50	50	30	6	38	44	6	14,8	20	30	6,5	
	in	1.97	1.97	1.18	0.24	1.50	1.73	0.24	0.58	0.79	1.18	0.25	
SAE 10/2	G 1/4	mm	60	60	35	6	48	54	6	18,8	25	35	6,5
		in	2.36	2.36	1.38	0.24	1.89	2.12	0.24	0.74	0.98	1.38	0.25
	G 3/8	mm	60	60	35	6	48	54	6	18,8	25	35	6,5
		in	2.36	2.36	1.38	0.24	1.89	2.12	0.24	0.74	0.98	1.38	0.25
	G 1/2	mm	60	60	35	6	48	54	6	18,8	25	35	6,5
		in	2.36	2.36	1.38	0.24	1.89	2.12	0.24	0.74	0.98	1.38	0.25
SAE8	mm	60	70	35	6	48	64	6	18,8	25	35	6,5	
	in	2.36	2.75	1.38	0.24	1.89	2.52	0.24	0.74	0.98	1.38	0.25	
SAE10	mm	70	70	35	6	58	64	6	18,5	35	35	6,5	
	in	2.75	2.75	1.38	0.24	2.28	2.52	0.24	0.73	1.38	1.38	0.25	
SAE12	mm	70	70	40	8	54	62	8	22	30	40	8,5	
	in	2.75	2.75	1.57	0.31	2.12	2.44	0.31	0.87	1.18	1.57	0.33	
SAE 12/2	G 1/2	mm	70	80	40	8	54	72	8	25	30	40	8,5
		in	2.75	3.15	1.57	0.31	2.12	2.83	0.31	0.98	1.18	1.57	0.33
	G 3/4	mm	70	90	40	8	54	82	8	25	30	40	8,5
		in	2.75	3.54	1.57	0.31	2.12	3.23	0.31	0.98	1.18	1.57	0.33
	SAE10	mm	70	85	40	8	54	77	8	25	30	40	8,5
		in	2.75	3.35	1.57	0.31	2.12	3.03	0.31	0.98	1.18	1.57	0.33
SAE12	mm	70	85	40	8	54	77	8	25	30	40	8,5	
	in	2.75	3.35	1.57	0.31	2.12	3.03	0.31	0.98	1.18	1.57	0.33	

## Dimensions

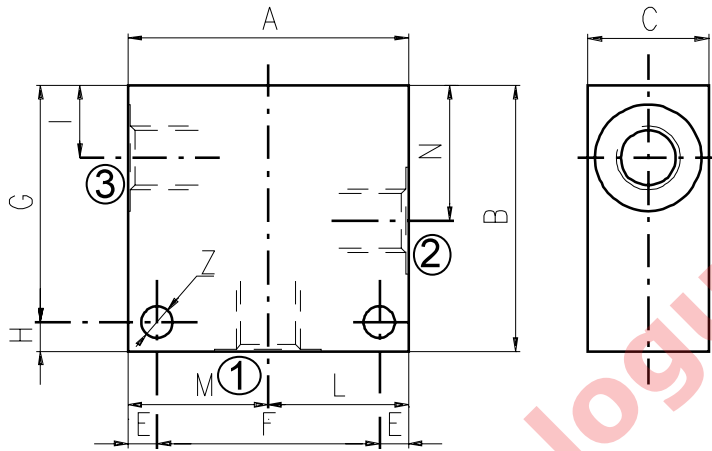
Cavity	Ports	A	B	C	E	F	G	H	I	L	M	Z	
SAE 16/2	G 1/2	mm	80	90	50	10	60	80	10	25	35	45	10,5
		in	3.15	3.54	1.97	0.39	2.36	3.15	0.39	0.98	1.38	1.77	0.41
	G 3/4	mm	80	90	50	10	60	80	10	25	35	45	10,5
		in	3.15	3.54	1.97	0.39	2.36	3.15	0.39	0.98	1.38	1.77	0.41
	G 1	mm	85	100	60	10	65	90	10	23,5	40	45	10,5
		in	3.35	3.94	2.36	0.39	2.56	3.54	0.39	0.92	1.57	1.77	0.41
	SAE12	mm	80	90	50	10	60	80	10	25	35	45	10,5
		in	3.15	3.54	1.97	0.39	2.36	3.15	0.39	0.98	1.38	1.77	0.41
	SAE16	mm	80	100	50	10	60	90	10	25	35	45	10,5
		in	3.15	3.94	1.97	0.39	2.36	3.54	0.39	0.98	1.38	1.77	0.41

## Order code

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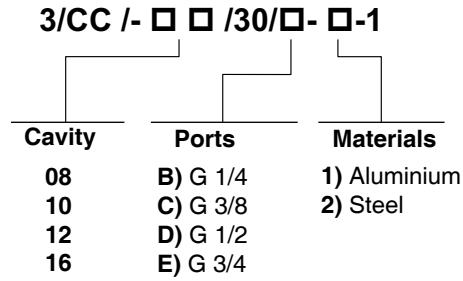


Material	Max. pressure bar	
	bar	psi
Aluminium	210	3050
Steel	350	5100



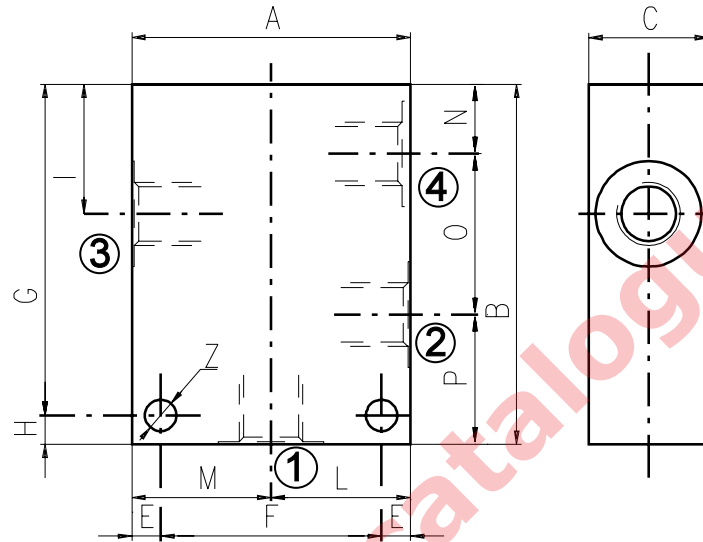
Cavity	Ports		A	B	C	E	F	G	H	I	L	M	N	Z
SAE 8/3	G 1/4	mm	60	60	30	7	46	48	12	14,8	30	30	29,1	6,5
		in	2.36	2.36	1.18	0.27	1.81	1.89	0.47	0.58	1.18	1.18	1.14	0.25
	G 3/8	mm	60	60	30	7	46	48	12	14,5	30	30	29,1	6,5
		in	2.36	2.36	1.18	0.27	1.81	1.89	0.47	0.57	1.18	1.18	1.14	0.25
	G 1/2	mm	70	65	35	7	56	53	12	14,5	35	35	29,1	6,5
		in	2.75	2.56	1.38	0.27	2.20	2.09	0.47	0.57	1.38	1.38	1.14	0.25
	SAE6	mm	60	60	30	7	46	48	12	14,5	30	30	29,1	6,5
		in	2.36	2.36	1.18	0.27	1.81	1.89	0.47	0.57	1.18	1.18	1.14	0.25
SAE 10/3	G 1/4	mm	60	65	35	6	48	59	6	18	30	30	34,5	7
		in	2.36	2.56	1.38	0.24	1.89	2.32	0.24	0.70	1.18	1.18	1.36	0.27
	G 3/8	mm	60	65	35	6	48	59	6	18,8	30	30	34,5	7
		in	2.36	2.56	1.38	0.24	1.89	2.32	0.24	0.74	1.18	1.18	1.36	0.27
	G 1/2	mm	65	70	35	6	53	64	6	18,8	32,5	32,5	34,5	7
		in	2.56	2.75	1.38	0.24	2.09	2.52	0.24	0.74	1.28	1.28	1.36	0.27
	SAE6	mm	65	70	35	6	53	64	6	18,8	32,5	32,5	34,5	7
		in	2.56	2.75	1.38	0.24	2.09	2.52	0.24	0.74	1.28	1.28	1.36	0.27
	SAE8	mm	65	70	35	6	53	64	6	18,8	32,5	32,5	34,5	7
		in	2.56	2.75	1.38	0.24	2.09	2.52	0.24	0.74	1.28	1.28	1.36	0.27
SAE 12/3	G 1/2	mm	70	100	40	8	54	92	8	25	35	35	53,5	8,5
		in	2.75	3.94	1.57	0.31	2.12	3.6	0.31	0.98	1.38	1.38	2.10	0.33
	G 3/4	mm	90	100	50	10	70	90	10	25,1	45	45	53,5	10,5
		in	3.54	3.94	1.97	0.39	2.75	3.54	0.39	0.99	1.77	1.77	2.11	0.41
	SAE10	mm	80	100	40	8	64	92	8	25	40	40	53,5	8,5
		in	3.15	3.94	1.57	0.31	2.52	3.6	0.31	0.98	1.57	1.57	2.11	0.33
	SAE12	mm	80	100	45	8	64	92	8	25	40	40	53,5	8,5
		in	3.15	3.94	1.57	0.31	2.52	3.6	0.31	0.98	1.57	1.57	2.11	0.33
SAE 16/3	G 3/4	mm	90	100	50	10	70	90	10	25,1	45	45	53,5	10,5
		in	3.54	3.94	1.97	0.39	2.75	3.54	0.39	0.99	1.77	1.77	2.11	0.41
	SAE12	mm	90	105	50	10	70	95	10	25,1	45	45	53,5	10,5
		in	3.54	4.13	1.97	0.39	2.75	3.74	0.39	0.99	1.77	1.77	2.11	0.41
	SAE16	mm	90	105	50	10	70	95	10	25,1	45	45	53,5	10,5
		in	3.54	4.13	1.97	0.39	2.75	3.74	0.39	0.99	1.77	1.77	2.11	0.41

Order code \_\_\_\_\_



see SAE cartridges catalogue

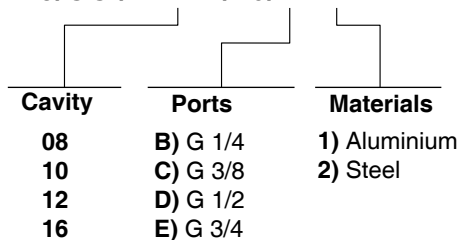
Material	Max pressure	
	bar	psi
Aluminium	210	3050
Steel	350	5100



Cavity	Ports	A	B	C	E	F	G	H	I	L	M	N	O	P	Z	
SAE 8/4	G 1/4	mm	60	75	30	7	46	63	12	29,1	30	30	14,8	29,1	31,1	6,5
		in	2.36	2.95	1.18	0.27	1.81	2.48	0.47	1.14	1.18	1.18	0.58	1.14	1.22	0.25
	SAE6	mm	60	75	30	7	46	63	12	29,1	30	30	14,8	29,1	31,1	6,5
		in	2.36	2.95	1.18	0.27	1.81	2.48	0.47	1.14	1.18	1.18	0.58	1.14	1.22	0.25
SAE 10/4	G 3/8	mm	60	85	35	6	48	79	6	34,5	30	30	18,8	31,7	34,5	7
		in	2.36	3.35	1.38	0.24	1.89	3.11	0.24	1.36	1.18	1.18	0.74	1.25	1.36	0.27
	G 1/2	mm	70	85	35	6	58	79	6	34,5	35	35	18,8	31,7	34,5	7
		in	2.75	3.35	1.38	0.24	2.28	3.11	0.24	1.36	1.38	1.38	0.74	1.25	1.36	0.27
	SAE6	mm	60	85	35	6	48	79	6	34,5	30	30	18,8	31,7	34,5	7
		in	2.45	3.35	1.38	0.24	1.89	3.11	0.24	1.36	1.18	1.18	0.74	1.25	1.36	0.27
	SAE8	mm	70	85	35	6	58	79	6	34,5	35	35	18,8	31,7	34,5	7
		in	2.75	3.35	1.38	0.24	2.28	3.11	0.24	1.36	1.38	1.38	0.74	1.25	1.36	0.27
SAE 12/4	G 1/2	mm	80	115	40	8	64	107	8	44	40	40	22	44,5	48,5	8,5
		in	3.15	4.53	1.57	0.31	2.52	4.21	0.31	1.73	1.57	1.57	0.87	1.75	1.9	0.33
	SAE10	mm	80	115	40	8	64	107	8	44	40	40	22	44,5	48,5	8,5
		in	3.15	4.53	1.57	0.31	2.52	4.21	0.31	1.73	1.57	1.57	0.87	1.75	1.9	0.33
SAE 16/4	G 3/4	mm	100	130	50	10	80	120	10	53,5	50	50	25,1	56,9	48	10,5
		in	3.94	5.12	1.97	0.39	3.15	4.72	0.39	2.11	1.97	1.97	0.99	2.24	1.89	0.41

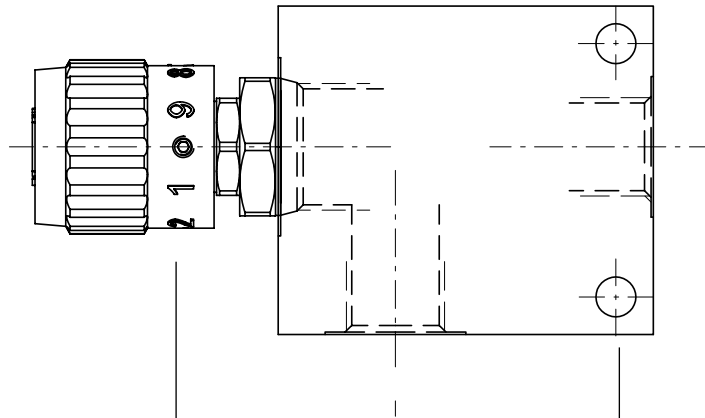
Order code

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# Informations

## How to order valves with body



**CARTRIDGE CODE**

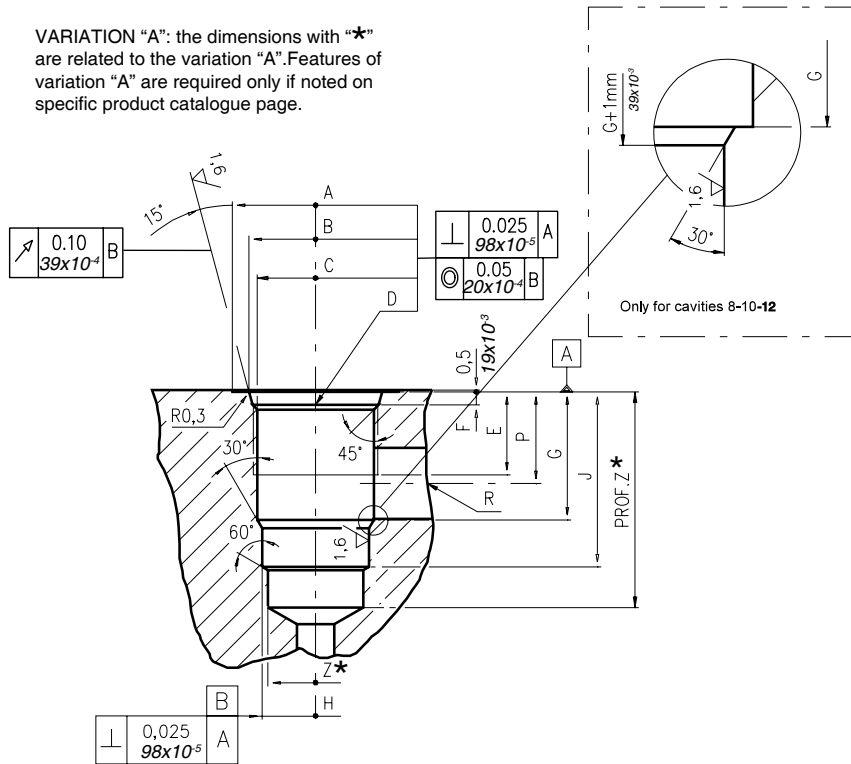
**NB-10-A/A-M-0B/**

**BILLET CODE**

**J-1-1**

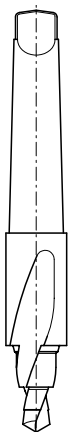
Cavity	Ports	Materials
08	B) G 1/4	1) Aluminium
10	C) G 3/8	
12	D) G 1/2	
16	E) G 3/4	
	F) G 1	
	J) SAE 6	2) Steel
	K) SAE 8	
	L) SAE 10	
	M) SAE 12	
	N) SAE 16	

VARIATION "A": the dimensions with "\*" are related to the variation "A". Features of variation "A" are required only if noted on specific product catalogue page.



I		A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	X	Z	Prof.Z
		±0,05	±0,05	±0,02					øMAX							øMAX	øMAX	øMAX	øMIN*	MIN*			
08/2	mm	27	20,66	17,42	3/4 -16 UNF	12,50	2,50	18,20	12,72	29,50	-	-	-	-	14,00	8,00	-	-	-	-	-	12,00	39
	in	1.06	0.81	0.68					0.49							0.10							
10/2	mm	30	24,00	20,62	7/8 -14 UNF	16,00	2,80	24,00	15,90	33,50	-	-	-	-	18,30	11,00	-	-	-	-	-	14,50	40
	in	1.18	0.94	0.81					0.63							0.11							
12/2	mm	38	29,23	24,73	1 1/16 -12 UNF	19,00	3,50	34,15	22,25	46,80	-	-	-	-	24,50	19,00	-	-	-	-	-	21,50	60
	in	1.50	1.15	0.97					0.75							0.14							
16/2	mm	45	35,58	31,34	1 5/16 -12 UNF	22,00	3,50	34,00	28,62	47,00	-	-	-	-	24,50	19,00	-	-	-	-	-	25,50	70
	in	1.77	1.40	1.23					0.87							0.14							

Rougher tool



Cavity	Code number
08/2	3UT00053190
10/2	3UT00056610
12/2	3UT00054090
16/2	3UT00054510

Finisher tool



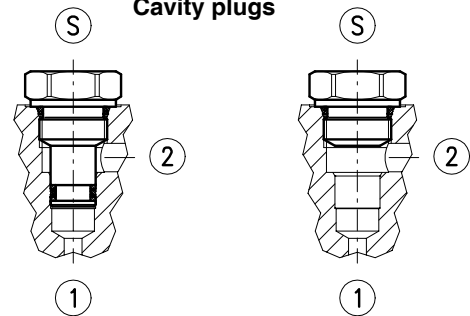
Cavity	Code number
08/2	3UT06A1270N
10/2	3UT00054580
12/2	3UT00054670
16/2	3UT00054520

Tap



Cavity	Code number
08/2	3UT03416UNF
10/2	3UT07814UNF
12/2	3UT0111612UN
16/2	3UT0151612UN

Cavity plugs



Cavity	Code number	①	②	Ⓢ
08/2	3XTP3533700	X	X	X
	3XTP1531900	0	0	X
10/2	3XTP3544200	X	X	X
	3XTP1542300	0	0	X
12/2	3XTP3555400	X	X	X
	3XTP1552900	0	0	X
16/2	3XTP3575500	X	X	X
	3XTP1572900	0	0	X

X=Closed 0=Open