CATALOGUE

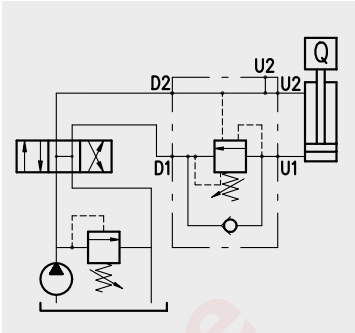
Counterbalance valves

walvoil
HYDRAULIC CONTROL SYSTEMS

Index

Operation

The oil flow is allowed from D1 to U1 and is stopped in the opposite way (from U1 to D1) up to the spring setting value. Free oil flow from U1 to D1 is strictly possible when the pilot pressure in D2 to U2 is strong enough to pilot the valve poppet.Use the following formula to assert the applicable pilot pressure: **(valve setting - load pressure) ÷ pilot ratio = pilot pressure**
for example: if your pilot ratio is 1:4, your setting pressure is 250 bar *(3600 psi)* and your load pressure is 130 bar *(1900 psi)* then you will need 30 bar *(430 psi)* pilot pressure in order to displace the load. [(250 bar-*3600 psi* - 130 bar-*1900 psi*) ÷ 4 = 30 bar-*430 psi*]. Should counterpressure arise in D1, the setting value of valve poppet (1:1 ratio) will increase and the pilot pressure be negatively affected (1:1 ratio). Lack of overcenter stability and troublesome motion even after complete valve assembly, will suggest that the valve application may require a PG version. Please contact our technical service for action.



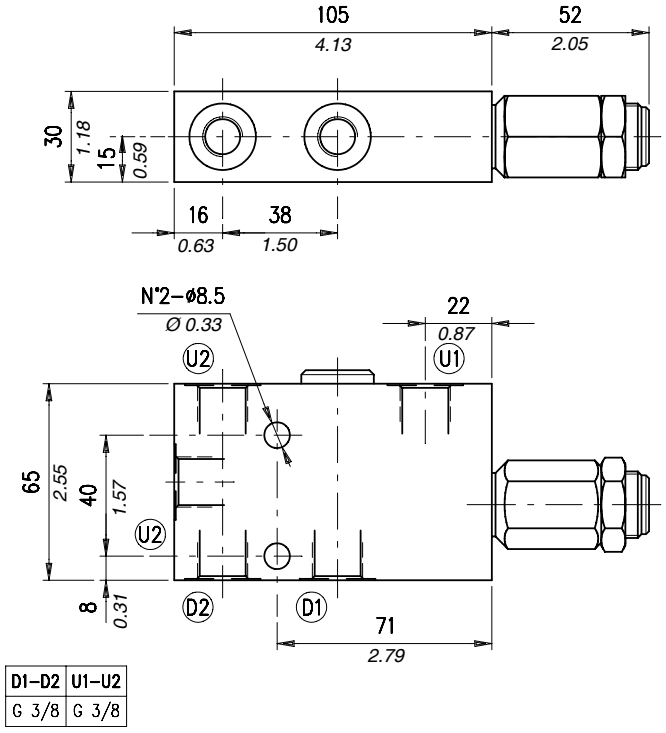
Performance

Body valves

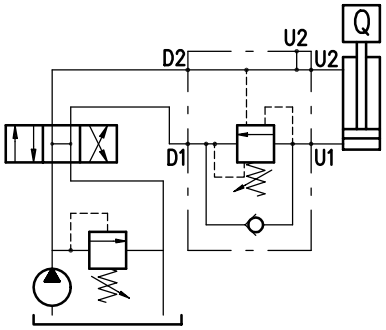
Overcenter cartridge: *VMPD 38 - **VMPD12 - ***VMPD34

Type	Maximum flow		Max. pressure		Application range with standard springs	Oil leakage from U1 to D1	Pilot ratio	Weight	
	l/min	*US gpm*	bar	*psi*				kg	*lb*
VOSL 38*	35	*9.2*	350	*5100*	5-210 bar-*72.5÷3050 psi* (test setting 150 bar-*2200 psi* at 5 l/min.-*1.3 US gpm*) 50-350 bar-*725÷5100 psi* (test setting 280 bar-*4060 psi* at 5 l/min.-*1.3 US gpm*) 100-700 bar-*1450÷10150 psi* (test setting 350 bar -*5100 psi* at 5 l/min.-*1.3 US gpm*)	0,25 cm³/min -*15x10⁻³ in³/min* (5 drops) at 210 bar -*3050 psi* and 80% of the spring setting value with oil viscosity of 46 cSt.	1:4 (standard) 1:3 (on request only)	0,78	*1.72*
								aluminium	
								1,52	*3.35*
								steel	
VOSL 12**	70	*18*					1:7 (standard) 1:3 (on request only)	1,00	*2.20*
								aluminium	
								1,95	*4.30*
								steel	
VOSL 34***	100	*26*						1,85	*4.08*
								aluminium	
								3,55	*7.83*
								steel	
VOSL 100***	180	*48*						3,26	*7.19*
								aluminium	
								7,07	*15.59*
								steel	
VOSL/F 38*	35	*9.2*					1:4 (standard) 1:3 (on request only)	0,75	*1.65*
								aluminium	
								1,45	*3.20*
								steel	
VOSL/F 12**	70	*18*					1:7 (standard) 1:3 (on request only)	0,98	*2.16*
								aluminium	
								1,96	*4.32*
								steel	
VOSL/F 34***	100	*26*						1,82	*4.01*
								aluminium	
								3,57	*7.87*
								steel	
VOSL/F 100***	180	*48*						3,23	*7.12*
								aluminium	
								7,12	*15.70*
								steel	

Dimensions and hydraulic circuit

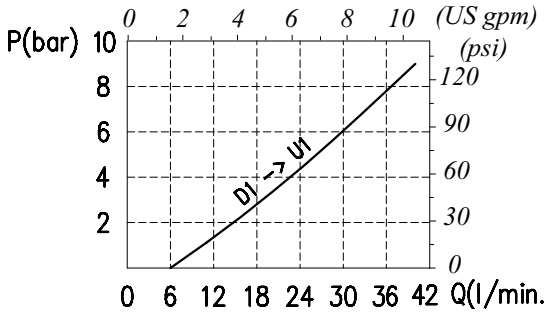


D1–D2	U1–U2
G 3/8	G 3/8

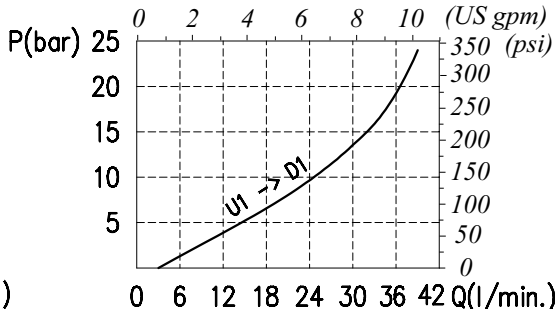


Rating diagrams

Typical pressure drop vs.flow characteristics



Typical pressure drop vs.flow characteristics

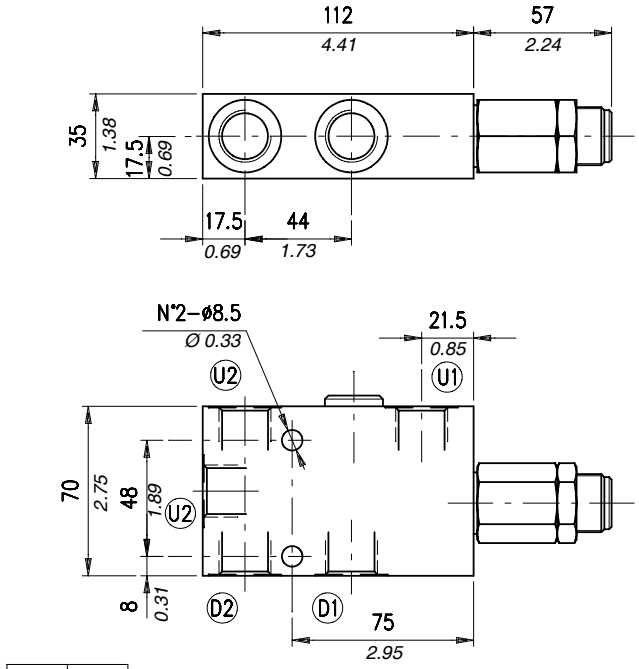


Order code

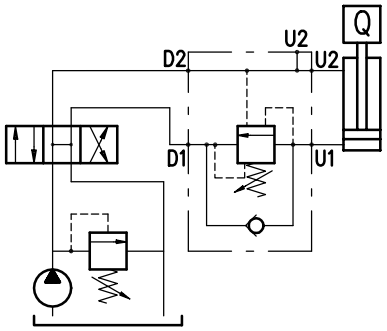
VOSL 38 / □ . S .□□ . □□ . □□ / □□

Pressure settings	Pilot ratio	Type of pilot	Check valve seat	Body material
TS) 5÷210 *(72.5÷3050 psi)* **TR)** 50÷350 *(725÷5100 psi)* (Standard) **TG)** 100÷700 *(1450÷10150 psi)*	**p3)** 1:3 **p4)** 1:4 (Standard)	_ Without damper (Standard) **PG)** With damper	_ See body **VR)** Hardened steel	_ Aluminium **ac** Steel

Dimensions and hydraulic circuit

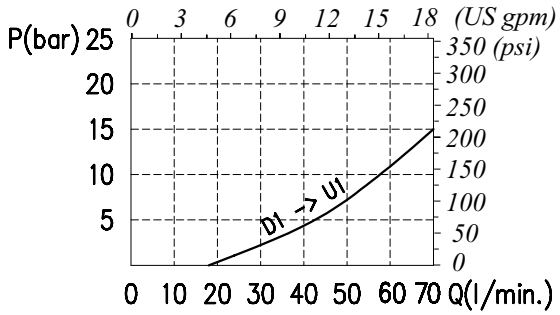


D1–D2	U1–U2
G 1/2	G 1/2

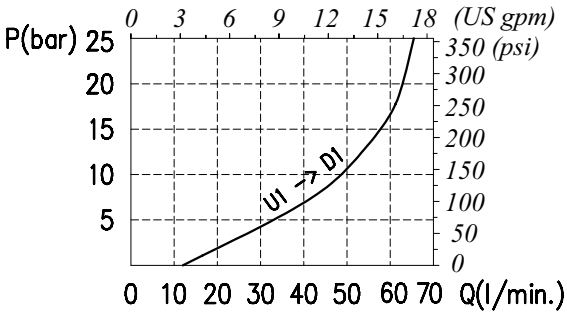


Rating diagrams

Typical pressure drop vs.flow characteristics



Typical pressure drop vs.flow characteristics



Order code

VOSL 12 / □ . S .□□ . □□ . □□ / □□

Pressure settings

TS) 5÷210 bar *(72.5÷3050 psi)*
TR) 50÷350 bar *(725÷5100 psi)* (Standard)
TG) 100÷700 bar *(1450÷10150 psi)*

Pilot ratio

p3) 1:3
p4) 1:7 (Standard)

Type of pilot

_ Without damper (Standard)
PG) With damper

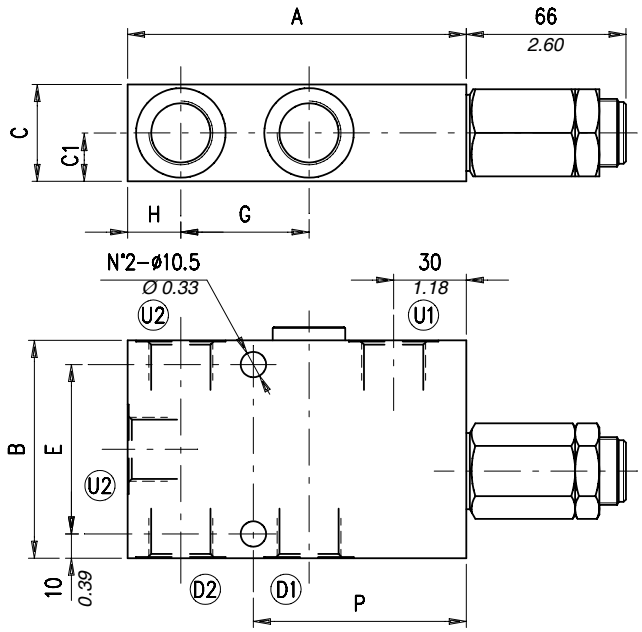
Check valve seat

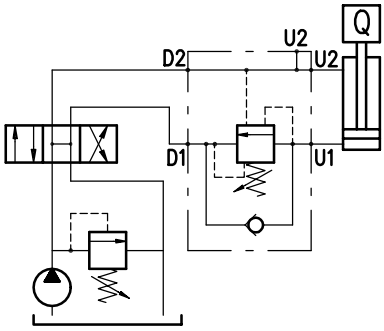
_ See body
VRR) Hardened steel

Body material

_ Aluminium
ac Steel

Dimensions and hydraulic circuit



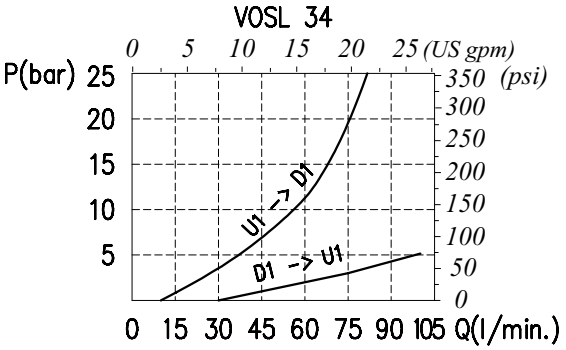


VOSL	D1–D2	U1–U2	A*	B*	C*	C1*	E*	G*	H*	P*
34	G 3/4	G 3/4	140 - *5.51*	90 - *3.54*	40 - *1.57*	20- *0.78*	70 - *2.75*	53 - *2.09*	22 - *0.66*	88 - *3.46*
100	G 1	G 1	174 - *6.85*	100 - *3.94*	60 - *2.36*	30- *1.18*	80 - *3.15*	66 - *2.60*	32 - *1.26*	110 - *4.33*

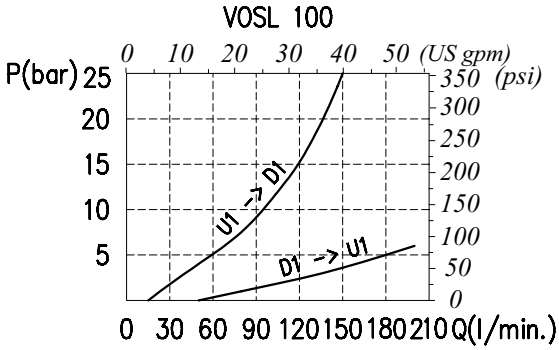
* Dimensions are in mm - *in*

Rating diagrams

Typical pressure drop vs.flow characteristics



Typical pressure drop vs.flow characteristics



Order code

VOSL □□ / □ . S .□□ . □□ . □□ / □□

Port size

34) G 3/4
100) G 1

Pressure settings

TS) 5÷210 bar *(72.5÷3050 psi)*
TR) 50÷350 bar *(725÷5100 psi)* (Standard)
TG) 100÷700 bar *(1450÷10150 psi)*

Pilot ratio

p3) 1:3
p7) 1:7 (Standard)

Type of pilot

_ Without damper
PG) With damper

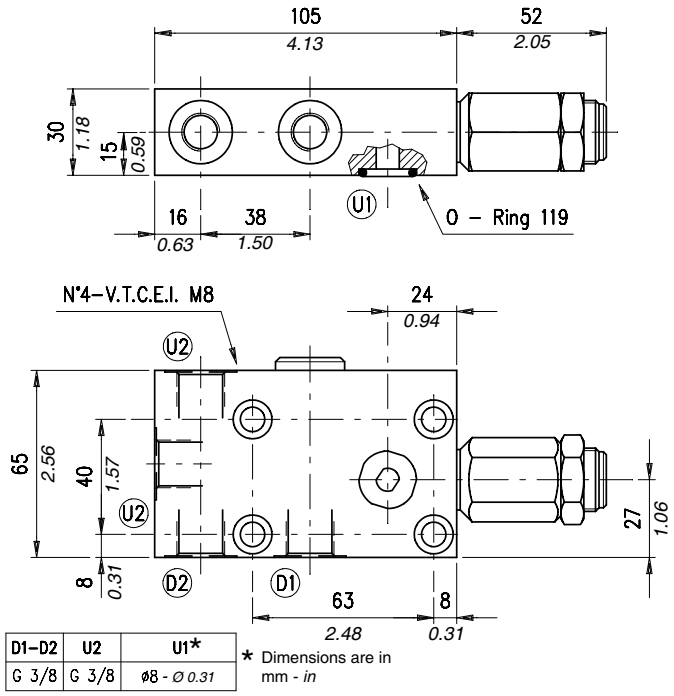
Check valve seat

_ See body
VRR) Hardened steel

Body material

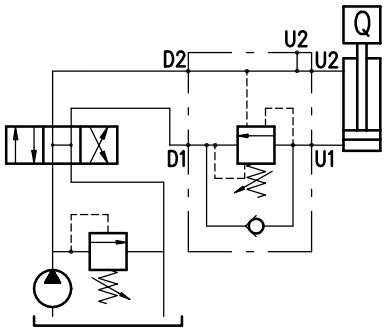
_ Aluminium
ac Steel

Dimensions and hydraulic circuit



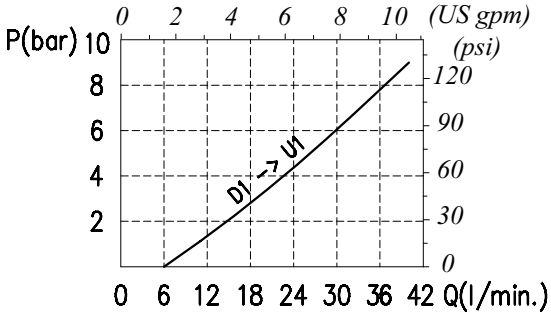
D1–D2	U2	U1*
G 3/8	G 3/8	ø8 - Ø 0.31

* Dimensions are in mm - *in*

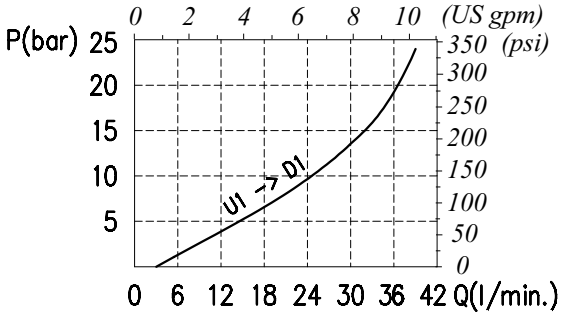


Rating diagrams

Typical pressure drop vs.flow characteristics



Typical pressure drop vs.flow characteristics



Order code

VOSL /F 38 / □ . S .□□ . □□ . □□ / □□

Pressure settings

TS) 5÷210 bar *(72.5÷3050 psi)*
TR) 50÷350 bar *(725÷5100 psi)* (Standard)
TG) 100÷700 bar *(1450÷10150 psi)*

Pilot ratio

p3) 1:3
p4) 1:4 (Standard)

Type of pilot

_ Without damper (Standard)
PG) With damper

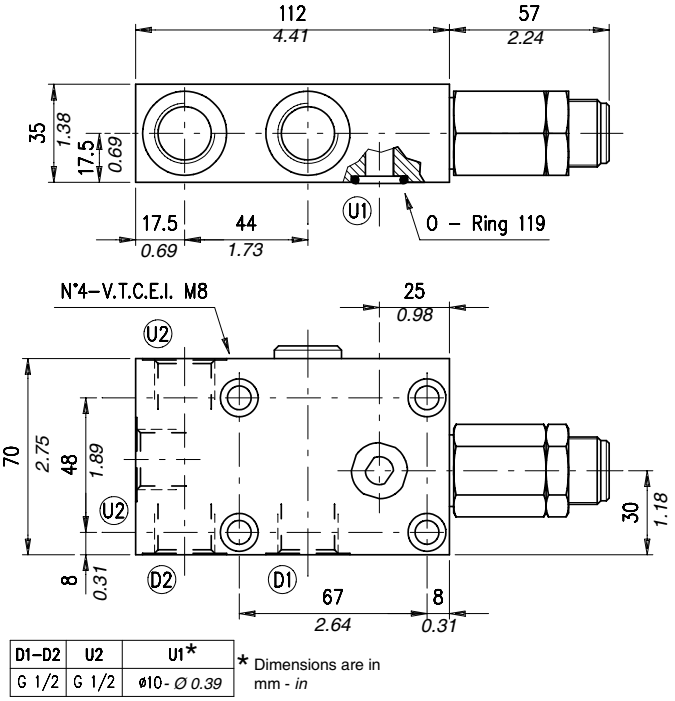
Check valve seat

_ See body
VRR) Hardened steel

Body material

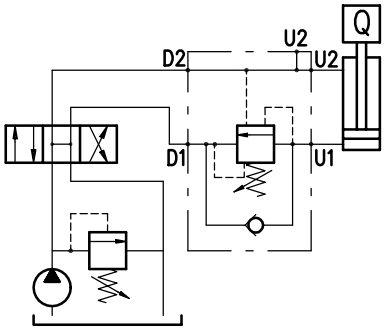
_ Aluminium
ac Steel

Dimensions and hydraulic circuit



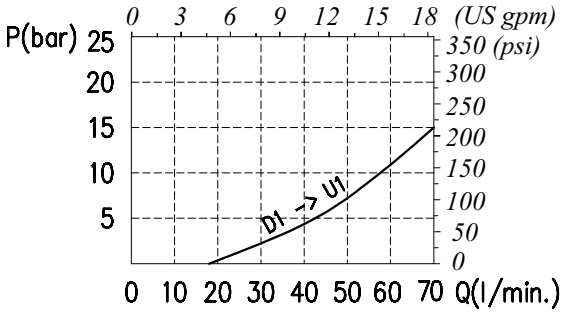
D1–D2	U2	U1*
G 1/2	G 1/2	ø10 - Ø 0.39

* Dimensions are in mm - *in*

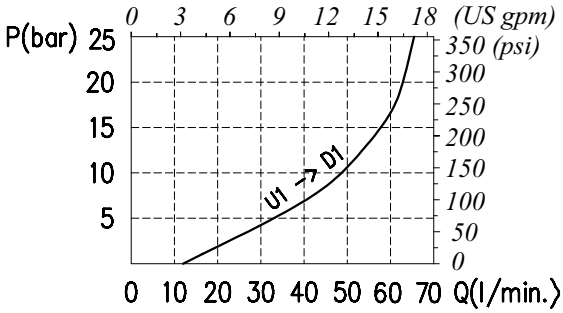


Rating diagrams

Typical pressure drop vs.flow characteristics



Typical pressure drop vs.flow characteristics



Order code

VOSL /F 12 / □ . S .□□ . □□ . □□ / □□

Pressure settings

TS) 5÷210 bar *(72.5÷3050 psi)*
TR) 50÷350 bar *(725÷5100 psi)* (Standard)
TG) 100÷700 bar *(1450÷10150 psi)*

Pilot ratio

p3) 1:3
p7) 1:7 (Standard)

Type of pilot

_ Without damper (Standard)
PG) With damper

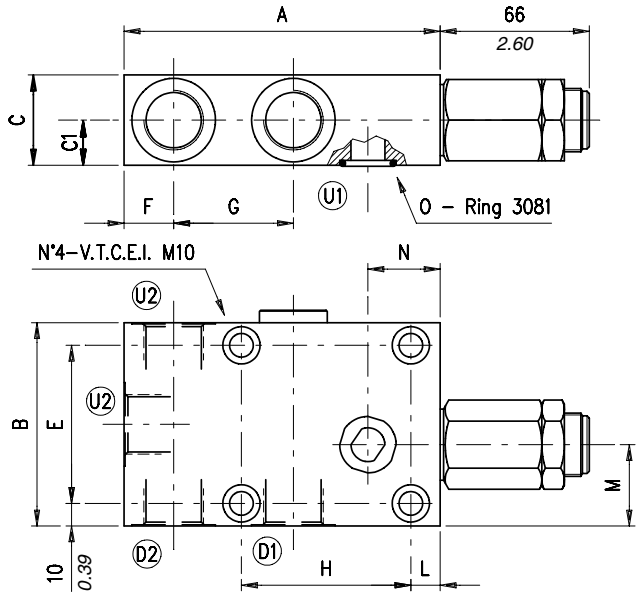
Check valve seat

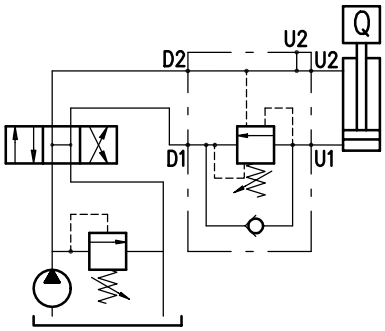
_ See body
VRR) Hardened steel

Body material

_ Aluminium
ac Steel

Dimensions and hydraulic circuit



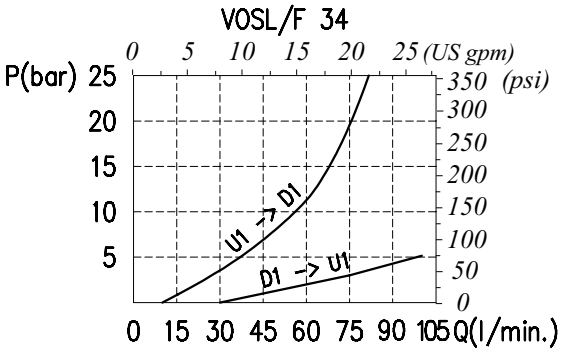


VOSL/F	D1–D2	U2	U1	A*	B*	C*	C1*	E*	F*	G*	H*	*	M*	N*
34	G 3/4	G 3/4	ø15 - Ø 0.59	140 - 5.51	90 - 3.54	40 - 1.57	20 - 0.78	70 - 2.75	22 - 0.87	53 - 2.09	75 - 2.95	13 - 0.51	36 - 1.42	32 - 1.26
100	G 1	G 1	ø19 - Ø 0.75	174 - 6.85	100 - 3.94	60 - 2.36	30 - 1.18	55 - 2.16	32 - 1.26	66 - 2.60	100 - 3.94	10 - 0.39	37 - 1.46	35 - 1.38

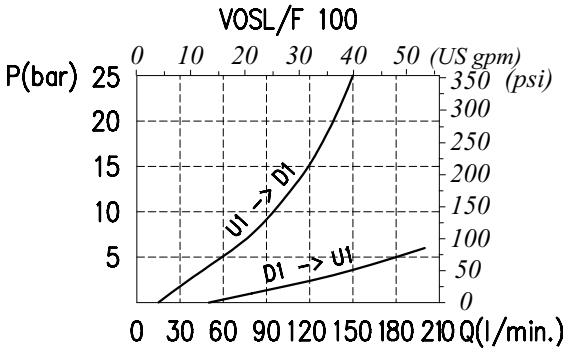
* Dimensions are in mm - *in*

Rating diagrams

Typical pressure drop vs.flow characteristics



Typical pressure drop vs.flow characteristics



Order code

VOSL /F □□ / □ . S .□□ . □□ . □□ / □□

Port size

34) 3/4" BSP
100) 1" BSP

Pressure settings (bar)

TS) 5÷210 *(72.5÷3050 psi)*
TR) 50÷350 (standard) *(725÷5100 psi)*
TG) 100÷700 *(1450÷10150 psi)*

Pilot ratio

p3) 1:3
p7) 1:7 (standard)

Type of pilot

_ without damper (standard)
PG) with damper

Check valve seat

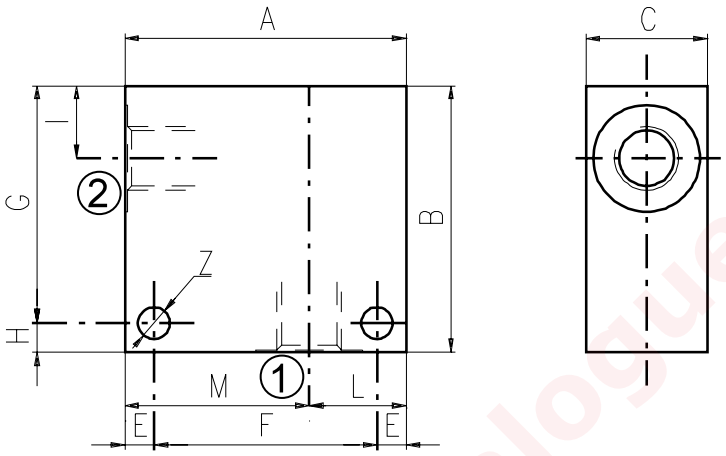
_ See body
VRR) Hardened steel

Body material

_ Aluminium
ac Steel

Dimensions

Material	Max. pressure	
	bar	*psi*
Alluminium	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*

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

3/CC /- □ □ /20/□- □-1

Cavity

08
10
12
16

Ports

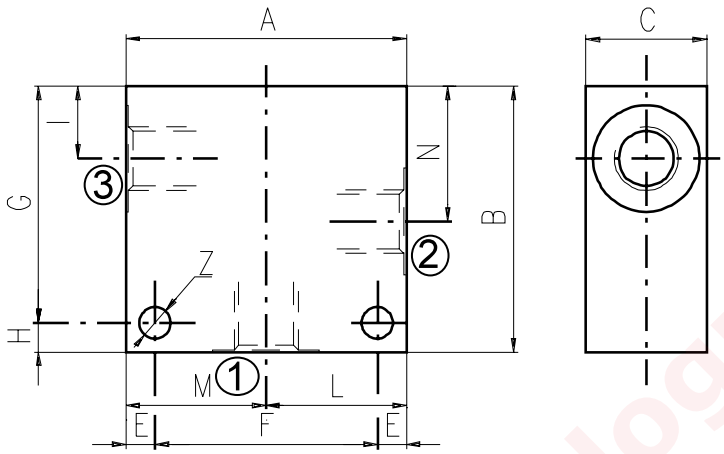
B) G 1/4
C) G 3/8
D) G 1/2
E) G 3/4
F) G 1

Materials

1) Aluminium
2) Steel

Dimensions

Material	Max. pressure	
	bar	*psi*
Alluminium	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*	*1.77*	*0.31*	*2.52*	*3.6*	*0.31*	*0.98*	*1.57*	*1.57*	*2.11*	*0.33*

Cavity	Ports		A	B	C	E	F	G	H	I	L	M	N	Z
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*

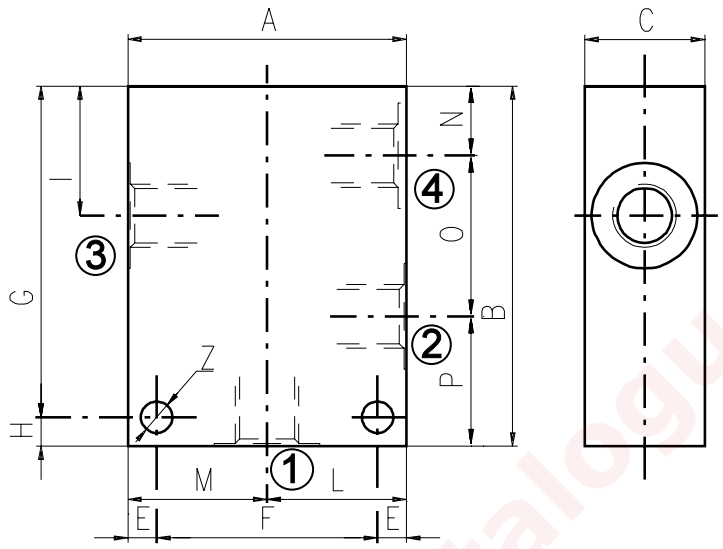
Order code

3/CC /- □ □ /30/□- □-1

Cavity	Ports	Materials
08	**B)** G 1/4	**1)** Aluminium
10	**C)** G 3/8	**2)** Steel
12	**D)** G 1/2	
16	**E)** G 3/4	

Dimensions

Material	Max. pressure	
	bar	*psi*
Alluminium	210	*3050*
Steel	350	*5100*



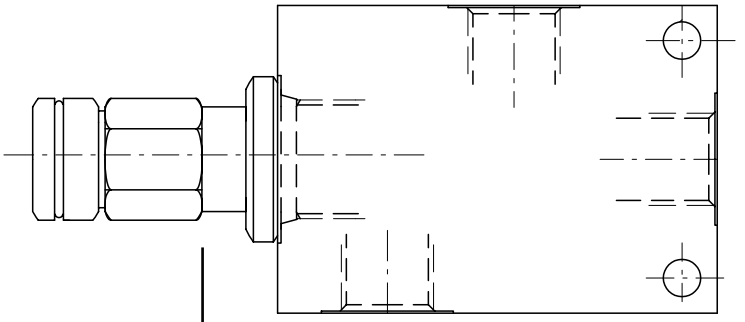
Cavity	Ports		A	B	C	E	F	G	H	I	L	M	N	O	P	Z
SAE 8/4	G 1/4	**mm**	60	75	30	7	46	63	12	29,1	30	30	14,8	29,1	31,1	6,5
		in	*2.36*	*2.95*	*1.18*	*0.27*	*1.81*	*2.48*	*0.47*	*1.14*	*1.18*	*1.18*	*0.58*	*1.14*	*1.22*	*0.25*
	SAE6	**mm**	60	75	30	7	46	63	12	29,1	30	30	14,8	29,1	31,1	6,5
		in	*2.36*	*2.95*	*1.18*	*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	*2.36*	*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*
	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

3/CC /- □ □ /40/□- □-1

Cavity	Ports	Materials
08	**B)** G 1/4	**1)** Aluminium
10	**C)** G 3/8	**2)** Steel
12	**D)** G 1/2	
16	**E)** G 3/4	

How to order valves with body

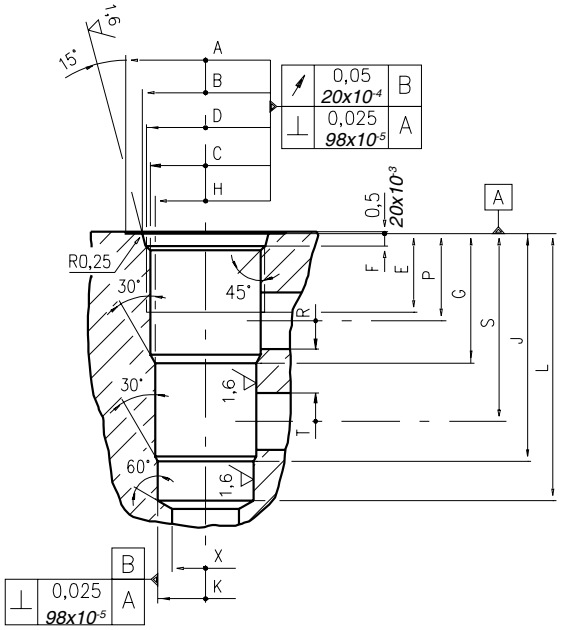


CARTRIDGE CODE **BILLET CODE**

CC-12-A/9-S-2B/ **D- 1-1**

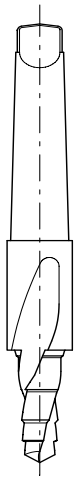
Cavity	Ports	Materials
08	B) G 1/4	1) Aluminium
10	C) G 3/8	
12	D) G 1/2	
16	E) G 3/4	
	F) G 1	
	J) SAE 6	2) Steel
	K) SAE 8	
	L) SAE 10	
	M) SAE 12	
	N) SAE 16	

Dimensions



\		A	B ±0,05	C ±0,05	D	E	F	G	H ±0,02	J	K ±0,02	L	M ±0,02	N	P	R øMAX	S	T øMAX	U	V øMAX	X øMAX	Z øMIN	Prof. Z MIN
08/3	mm	27	20,66	17,42	3/4-16 UNF	12,50	2,5	19,10	15,90	33,30	14,30	43,30	-	-	14,30	5,50	28,60	5,50	-	-	12,50	-	-
	in	*1.06*	*0.81*	*0.68*		*0.49*	*0.10*	*0.75*	*0.62*	*1.31*	*0.56*	*1.70*			*0.56*	*0.22*	*1.12*	*0.22*			*0.49*		
10/3	mm	30	24,00	20,62	7/8-14 UNF	16,00	2,80	23,10	17,50	39,60	15,90	47,60	-	-	18,30	6,50	34,00	6,50	-	-	14,00	-	-
	in	*1.18*	*0.94*	*0.81*		*0.63*	*0.11*	*0.94*	*0.69*	*1.56*	*0.62*	*1.87*			*0.72*	*0.25*	*1.34*	*0.25*			*0.55*		
12/3	mm	38	29,23	24,73	1 1/16-12 UNF	19,00	3,56	36,60	23,82	63,50	22,25	75,40	-	-	24,50	16,00	53,00	16,00	-	-	19,00	-	-
	in	*1.50*	*1.15*	*0.97*		*0.75*	*0.14*	*1.44*	*0.94*	*2.5*	*0.88*	*2.97*			*0.96*	*0.63*	*2.09*	*0.63*			*0.75*		
16/3	mm	45	35,6	31,34	1 5/16-12 UNF	22,00	3,5	36,50	28,62	64,30	27.02	75,38	-	-	24,60	16,00	53,00	16,00	-	-	19,00	-	-
	in	*1.77*	*1.40*	*1.23*		0.87	0.14	1.44	1.13	2.53	1.06	2.97			*0.97*	*0.63*	*2.09*	*0.63*			*0.75*		

Rougher tool



Cavity	Code number
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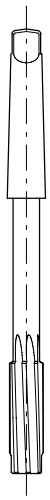
10/3	3UT00054170
12/3	3UT00054290
16/3	3UT00054470

Finisher tool



Cavity	Code number
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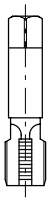
10/3	3UT00054180
12/3	3UT00054300
16/3	3UT00054480

Tap



Cavity	Code number
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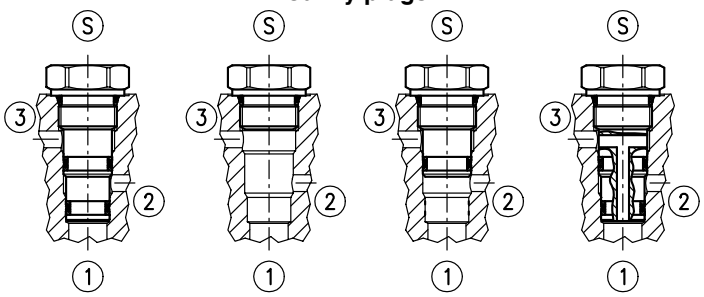
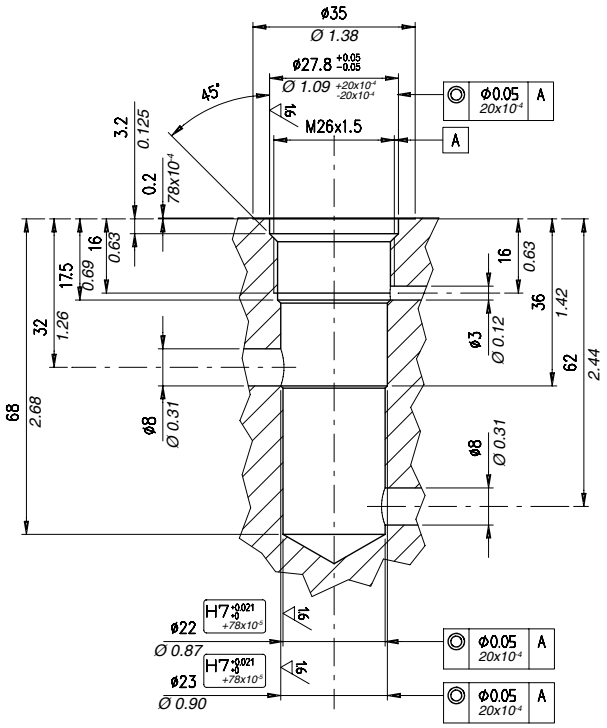
10/3	3UT07814UNF
12/3	3UT0111612UN
16/3	3UT0151612UN

Cavity plugs

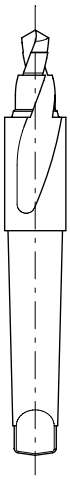


Dimensions



Rougher tool

Cod.3UT00052430

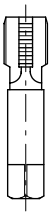


Finisher

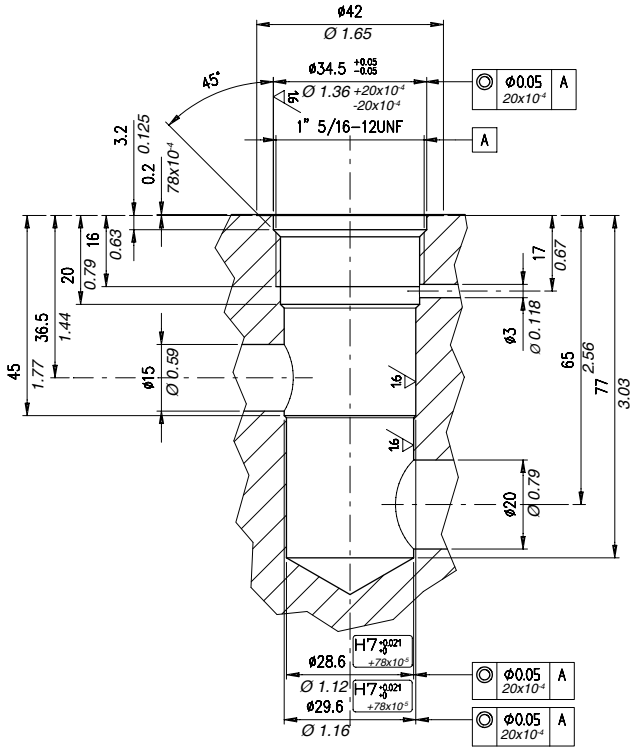
Cod.3UT00053540

Tap

Cod.3UT08A26F150

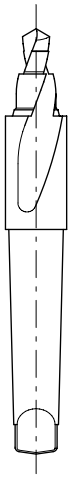


Dimensions



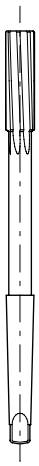
Rougher tool

Cod.3UT00053530



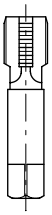
Finisher

Cod.3UT00053550

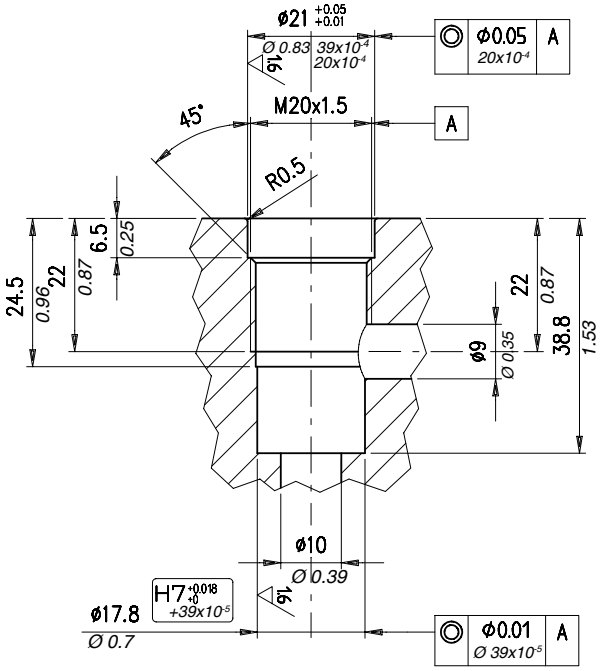


Tap

Cod.3UT0151612UN

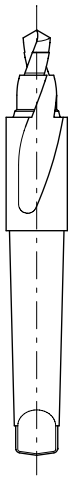


Dimensions



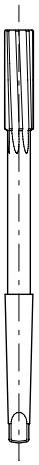
Rougher tool

Cod.3UT00050050



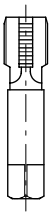
Finisher

Cod.3UT00055040

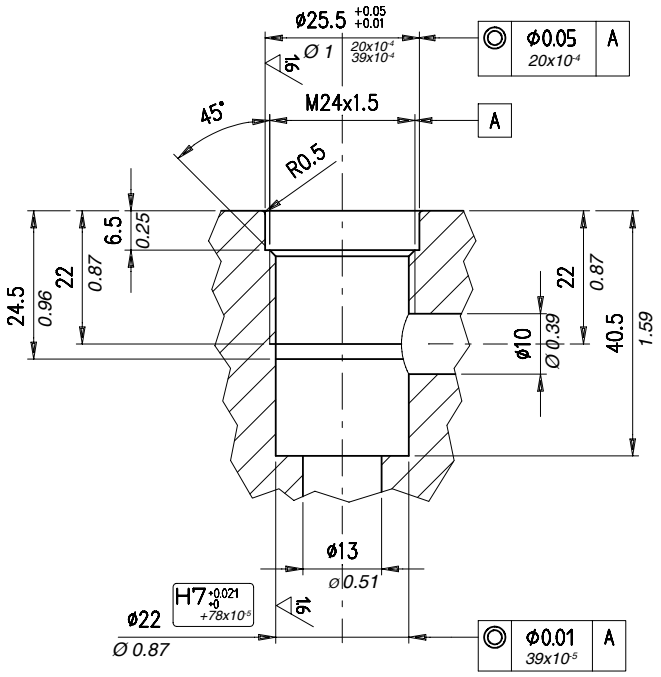


Tap

Cod.3UT08A20F150

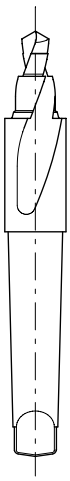


Dimensions



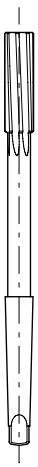
Rougher tool

Cod.3UT00050070



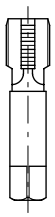
Finisher

Cod.3UT06A22000P

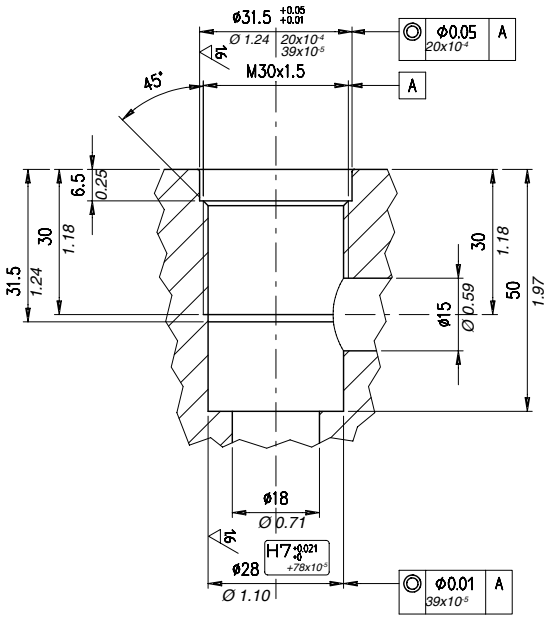


Tap

Cod.3UT08A24F150

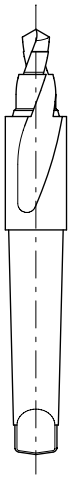


Dimensions



Rougher tool

Cod.3UT00050100



Finisher

Cod.3UT06A2800P

Tap

Cod.3UT08A30F150