Yale®

Manual directional valves

VHP
VHH

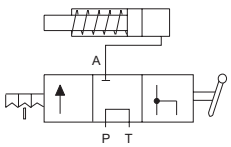
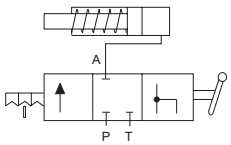
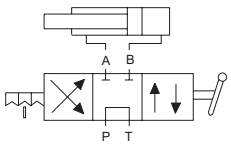
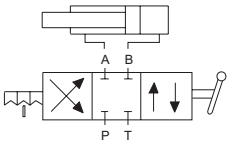
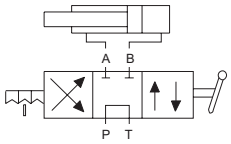
Directional valves

700 bar, manually operated

These directional valves control the oil flow in combination with hydraulic power packs (YHH - 4/3 with hand pumps).
All valves have 3 lever positions to control movement of the connected hydraulic cylinder:

1. left : cylinder advance
2. middle : cylinder neutral (pressureless circuit)
3. right : cylinder retracts

In the middle position (hold) the piston of the cylinder stops and the oil flow is guided in a circuit back to the reservoir (“P“ to “T“). The valves can be flanged directly onto power packs or remote connected by using hydraulic piping. “P“ and “T“ are connected to the bottom of the valve base.
In addition all valves are equipped with a second pressure oil port “P“ at the back of the valve base. This port can easily be used to connect a pressure gauge and a pressure relief valve (e.g. VPR - 1).
The oil port “T“ shall always be connected to the reservoir without any back pressure.

Model	Pressure max. bar	Oil flow max. l/min	Size	Oil ports	Hydraulic symbol	Applications
VHP - 3/3-1	700	8-16	1	3/8 NPT		3/3-way valve with “open centre“ in middle position (pressureless circuit) to control single-acting hydraulic cylinders, standard valve for smaller power packs, size 1
VHP - 3/3-2	700	20-40	2	3/8 NPT		3/3-way valve with “open centre“ in middle position (pressureless circuit) to control single-acting hydraulic cylinders, standard valve for larger power packs, size 2
VHP - 3/3-1 CC	700	8-16	1	3/8 NPT		3/3-way valve with “closed centre“ in middle position to control single-acting hydraulic cylinders, only for specific multiple valve configuration, size 1
VHP - 3/3-2 CC	700	20-40	2	3/8 NPT		3/3-way valve with “closed centre“ in middle position to control single-acting hydraulic cylinders, only for a multitude of valve operations, size 2
VHP - 4/3-1	700	8-16	1	3/8 NPT		4/3-way valve with “open centre“ in middle position (pressureless circuit) to control double-acting hydraulic cylinders, standard valve for smaller power packs, size 1
VHP - 4/3-2	700	20-40	2	3/8 NPT		4/3-way valve with “open centre“ in middle position (pressureless circuit) to control double-acting hydraulic cylinders, standard valve for larger power packs, size 2
VHP - 4/3-1 CC	700	8-16	1	3/8 NPT		4/3-way valve with “closed centre“ in middle position to control double-acting hydraulic cylinders, only for specific multiple valve configuration, size 1
VHP - 4/3-2 CC	700	20-40	2	3/8 NPT		4/3-way valve with “closed centre“ in middle position to control double-acting hydraulic cylinders, only for specific multiple valve configuration, size 2
VHH - 4/3	700	2-3	small special design	3/8 NPT 1/4 NPT		4/3-way valve with “open centre“ in middle position (pressureless circuit) to control double-acting hydraulic cylinders. Special design to be mounteded directly to all HPS hand pumps (with connecting set FY - 703). Also suitable for small hydraulic power packs.

Yale®

Solenoid directional valves VEP

Solenoid directional valves

700 bar, incl. pressure set valve

Application/Function

Solenoid operated valves are used to control the connected hydraulic cylinder by means of a pendant remote control or further electrical controls like pressure switches or limit switches.

Control principle

All solenoid valves have 3 positions:
- advance - stop - retract -
In neutral position (stop) the valves switch to "pressureless circuit" so that the oil flow is guided back to the reservoir while the connected cylinder is safely held under pressure.
Normally solenoid valves are mounted directly onto power packs but can also be remote mounted by using hydraulic piping.

Design

Long life "direct controlled" ball seal valves with leak-free "load hold function" in neutral position. The solenoids guarantee a very quick reaction of the valves so that cylinders can be controlled millimeterwise. The valves are suitable for continuous operation (100% on/off duration).

Modular design

The modular principle allows special valve configurations e.g. control of multiple cylinder systems or specific control sequences.

Pressure adjustment

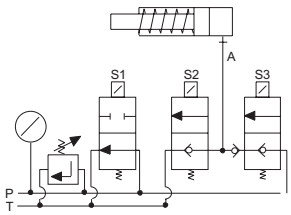
All solenoid valves are equipped with a precision-adjustable pressure set valve which allows the system pressure (force of cylinder) to be limited to any value from 0 to 700 bar.

Pressure gauge

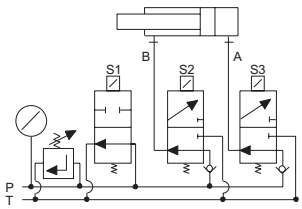
A glycerine damped pressure gauge GGY - 631 is standard with solenoid valves, 0-1000 bar, Ø 63 mm.

Mounting flange

The valve flanges are designed in a way that valves (with pressure connector) can easily be mounted onto Yale power packs.



VEP - 3/3-1 and **VEP - 3/3-2**
for single-acting cylinders



VEP - 4/3-1 and **VEP - 4/3-2**
for double-acting cylinders

Model	Control	for cylinder	Pressure max. bar	Size	permitted max. oil flow l/min.	Control voltage	Oil ports P T A B	Pressure relief valve	Weight kg
VEP - 3/3-1	3/3-way	single-acting	700	1	12	24 V =	3/8 NPT	yes	4,1
VEP - 3/3-2	3/3-way	single-acting	700	2	25	24 V =	3/8 NPT	yes	7,9
VEP - 4/3-1	4/3-way	double-acting	700	1	12	24 V =	3/8 NPT	yes	4,1
VEP - 4/3-2	4/3-way	double-acting	700	2	25	24 V =	3/8 NPT	yes	7,9

Yale®

Valves

VSM
VHM

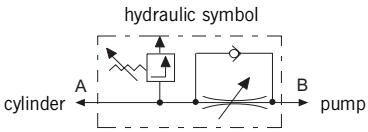
Operation

After closing the relief valve (hand wheel) the cylinder can be advanced via the by-pass.
In direction to the cylinder the valves always have free flow. The built-in check valve ensures that a pressurized cylinder (e.g. a lifted load) is held precisely in stop position. A smooth lowering speed can be adjusted by opening the throttle valve (hand wheel) in order to relieve the pressure.
A safety pressure valve protects the cylinder from being overloaded by external loading.

Safety-check valves

700 bar

These safety-check valves are used for those applications where pressure drops (e.g. holding of a lifted load) must be avoided. Depending on the location in an hydraulic circuit these valves can have different functions. The model VSM - 11 can be directly screwed into the oil port of a hydraulic cylinder and works at this location as a “hose break fuse“. The design of the VSM - 21 is suitable for a combination with VHP directional valves.
At this location the VSM - 21 ensures that the pressure is held precisely and that pressure drops caused by operating the directional valve are avoided.



Selection advice

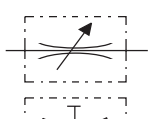
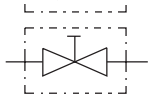
If the valve is to be screwed directly into a hydraulic cylinder, please order VSM - 11.
If the valve is to be combined with the directional valve of a power pack please order VSM - 21 (see photo on page 38).

Model	Pressure max. bar	Design	Oil port cylinder side A	Oil port pump side B	Width mm	Dimensions mm length	width	height	Weight kg
VSM - 11	700	needle	3/8-18 NPT outer	3/8-18 NPT inner	6	75	25	100	0,9
VSM - 21	700	needle	3/8-18 NPT inner	3/8-18 NPT outer	6	75	25	100	1,0

Throttle-/Shut-off valves

700 bar

These valves are used to shut-off hydraulic lines especially in multiple cylinder systems. The needle valve VHM - 1 also allows you to throttle an oil flow especially within lifting applications.

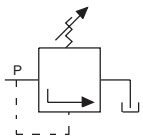
Model	Pressure max. bar	Design	Oil ports both ends	Width mm	Dimensions in mm length	width	height	Weight kg	Hydraulic symbols
VHM - 1	700	needle	3/8-18 NPT inner	6	70	28	88	0,4	
VHM - 2	700	ball	3/8-18 NPT inner	6	83	45	61	0,9	
VHM - 3	700	ball	M18 x 1,5 outer	6	84	45	61	0,9	

Pressure valves
Pressure switch
VPR
VPS

Pressure relief valves

0 - 700 bar

Pressure relief valves are used when the system pressure (force of the connected hydraulic cylinder) should not exceed a certain value.
These precision adjustable valves can be set to any pressure value between 0 and 700 bar by means of a turning knob.
After achieving the set pressure value, the excessive oil is guided back to the reservoir (pressureless).
Pressure relief valves are supplied with the necessary fittings and 0,5 m return hose.

Model	Control range bar	Oil ports P	Oil ports T	Max. oil flow l/min	Dimensions in mm length	Dimensions in mm Ø	Weight kg	Hydraulic symbol
VPR - 1	0-700	G 3/8	G 1/4	10	120	40	0,8	
VPR - 3	0-700	3/8-NPT	1/4-NPT	5	145	40	1,2	
VPR - 6	0-700	3/8-NPT	1/4-NPT	16	185	47	2,2	

Pressure switch

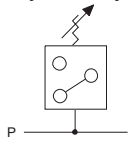
100 - 800 bar

This precision adjustable pressure switch can be set to any pressure value between 100 and 800 bar by means of a turning knob. When the set pressure value is reached, an electrical alternating contact is activated.

This signal can be used:

- for automatic pressure limiting
- to report a certain pressure value
- as an automatic motor on/off switch with “pressure guard“ power packs.

As soon as the pressure has reached the set value, a micro-switch (alternating contact) is activated. Should the pressure drop, the micro-switch starts the pump again in order to rebuild the pressure.

Model	Pressure range bar	Electrical data	Oil port	Difference of switch point bar	Repeat accuracy bar	Dimensions mm	Weight kg	Hydraulic symbol
VPS - 1	100-800	5 A / 250 V	3/8 NPT	25-70	10	130 x 85	0,5	

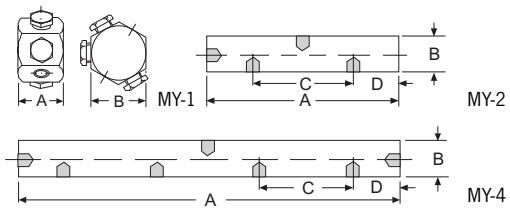
Yale®

Manifolds
MY

Manifolds, 700 bar

Manifolds are used when several hydraulic cylinders have to be connected to one hydraulic pump.
All manifolds are equipped with 3/8 NPT inner oil ports, so that fittings, hydraulic hoses and couplers can easily be attached.
To connect a manifold directly to a hand pump a FY - 1 double nipple is recommended.
Each manifold is supplied with three steel blind plugs in case not all the oil ports are required.

Model	Oil ports	Dimensions in mm A	B	C	D	Weight kg
MY - 1	6 x 3/8-NPT inner	40	50	–	–	0,5
MY - 2	4 x 3/8-NPT inner	150	40	90	30	0,6
MY - 4	7 x 3/8-NPT inner	330	40	90	30	1,4



above:
MY - 44 - GYA and MY - 22 - GYA
below:
MY - 44 and MY - 22

"Typical combinations" on page 71 to 73.

Manifolds
with shut-off valve, 700 bar

Manifolds with shut-off valves are used when different pressures must be maintained in each hydraulic line and therefore allow the lifting of unequal loads. The manifolds are ready assembled and can be screwed directly to a hand pump or power pack. Depending on the way of assembly a short hose HHC - 10 and a coupler half CFY - 1 can be helpful. Manifold models MY ... GYA are equipped with the corresponding number of shut-off valves plus pressure gauge sets (GYA - 63) which allow a permanent reading of each individual load.

Model	Description	Weight, kg
MY - 22	Manifold with 2 shut-off valves	1,8
MY - 44	Manifold with 4 shut-off valves	3,7
MY - 66	Manifold with 6 shut-off valves	5,5
MY - 22 - GYA	Manifold with 2 shut-off valves and 2 pressure gauges	2,8
MY - 44 - GYA	Manifold with 4 shut-off valves and 4 pressure gauges	5,7
MY - 66 - GYA	Manifold with 6 shut-off valves and 6 pressure gauges	8,5

Hand pump HPS - 2/2
with manifold MY - 44

Electric power pack
PY - 07/3/20/3M with VSM - 21 and MY - 44

Transportation box

for hand pumps, hydraulic cylinders and accessories

For easy transportation and protection of your valuable tools. Large enough to take a hand pump with pressure gauge and hydraulic hose plus several hydraulic cylinders.
The sturdy sheet metal box is equipped with a solid handle and two clasps.

Model: HPK - 10

- Dimensions:
  length 800, width 300, height 170 mm
- Weight, approx.: 7,8 kg

Hydraulic oil

for all hand pumps and power packs

The high quality of the Yale hydraulic oil guarantees a long service life for your equipment.
The high grade HLP oil has the following features:

- class of viscosity: ISO VG 32
- high lubrication index
- high pressure resistance
- favourable temperature/viscosity index
- protection against corrosion and cavitation
- minimizes the formation of foam and sludge
- good derivation of temperature
- good compatibility with all sealing materials

Model	Content/Litre
HFY - 1	1
HFY - 5	5
HFY - 10	10
HFY - 20	20

Yale®

Pressure gauges
GGY

Pressure gauges

The use of pressure gauges is recommended when the operating pressure (the force of the connected cylinder) should be monitored.
Yale pressure gauges are equipped with a stainless steel housing and an acrylic plastic face cover plate.
To absorb pressure shocks gauges are glycerine-filled, thus contributing to a long service life.
Also, when fitted to a motor pump the pointer will stay jitterfree.
For the calculation of applied cylinder forces corresponding converting charts (pressure vs. force) can be supplied for all Yale hydraulic cylinders.

Model	Pressure range bar	Scale Ø mm	Glycerine damped	Oil port	Spanner size	Accuracy class
GGY - 631	0-1000	63	yes	G 1/4	14	1,6
GGY - 632	0-1000	63	yes	1/4 NPT	14	1,6
GGY - 1001	0-1000	100	yes	G 1/2	22	1,0
GGY - 1004	0-700	100	yes	G 1/2	22	1,0
GGY - 1001 SZ*	0-1000	100	yes	G 1/2	22	1,0
GGY - 2500	0-2500	100	yes	G 1/2	22	1,6

*GGY - 1001 SZ = with maximum pointer

Yale®

Pressure gauge set and adaptors

GYA GA

Pressure gauge GYA - 63

This pressure gauge set is suitable for connection to all HPS hand pumps. Assembled ready to use, compact design with 45° inclination for easy reading. Consisting of pressure gauge GGY - 632 and corresponding gauge adaptor.

Model GYA - 63

pressure gauge	:	0-1000 bar, Ø 63 mm, glycerine-damped
oil port pump	:	3/8-NPT outer
oil port hose	:	3/8-NPT inner

Pressure gauge adaptor

These pressure gauge adaptors are suitable for connection to all HPS hand pumps.
Gauge connection with sleeve nut and 30° inclination for easy reading.
GA - 700 for small pressure gauges
GA - 701 for large pressure gauges

Model GA - 700

oil port gauge	:	G 1/4
oil port pump	:	3/8-NPT outer
oil port hose	:	3/8-NPT inner

Model GA - 701

oil port gauge	:	G 1/2
oil port pump	:	3/8-NPT outer
oil port hose	:	3/8-NPT inner

Pressure gauge adaptor set

This pressure gauge adaptor set is suitable for connection to all HPH hand pumps (for double acting cylinders). To be connected between 4-way valve and hand pump. Advantage: shows both the pushing force and the pulling force of the connected hydraulic cylinder. With 30° inclination for easy reading. Pressureless return line by means of the telescopic double nipple (see page 25).

Model GA - 703

oil port gauge	:	G 1/2
oil port pump	:	3/8-NPT outer
oil port hose	:	3/8-NPT outer

Model GA - 704

oil port gauge	:	G 1/4
oil port pump	:	3/8-NPT outer
oil port hose	:	3/8-NPT outer

Pressure gauge adaptor

This pressure gauge adaptor is suitable for connection to all TWZ hand pumps (2000 bar). With 30° inclination for easy reading. Suitable for pressure gauge GGY - 2500 (see page 28).

Model GA - 2000

max. pressure	:	2000 bar
oil port gauge	:	G 1/2
oil port pump	:	M22 x 1,5 outer (with seal cone)
oil port hose	:	M22 x 1,5 inner (for FY - 201)

Hydraulic couplers

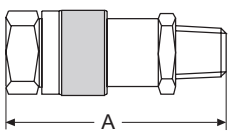
Hydraulic couplers

Hydraulic couplers are necessary for the connecton of various cylinders to one pump but are also important to offer an axial rotating possibility for the connected cylinder. Yale hydraulic couplers are self-sealing which means that the coupler halves only have to be closed hand tight. Both female and male parts have inner balls which seal the coupler halves in un-coupled condition, so that no hydraulic fluid will leak.

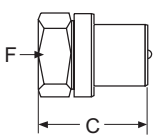
Please note that all Yale hydraulic cylinders are equipped with the standard female coupler half CFY - 1 and dust cap CDF - 9.

Model	Description	Connection thread	pressure bar	Dimensions in mm A	B	C	D	E	F
CFY - 1	Coupler half, female (standard)	3/8-NPT, outer	700	–	72	–	35	24	–
CFY - 2	Coupler half, female	3/8-NPT inner	700	–	78	–	35	27	–
CFY - 18	Coupler half, female	M18 x 1,5 outer	700	–	72	–	35	24	–
CFY - 10-S	Coupler half, female	pipe Ø 10 mm	700	–	72	–	35	24	–
CMY - 1	Coupler half, male	3/8-NPT, inner	700	–	–	38	–	–	32
CCY - 1	Coupler halves, female + male	3/8-NPT	700	85	–	–	–	–	–
CDF - 9	Dust cap, rubber, fits to female and male coupler halves (standard with all female coupler halves)								

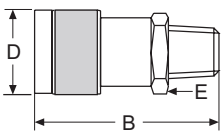
Coupler complete
CCY - 1



Coupler half, male
CMY - 1



Coupler half, female
CFY - 1



Hydraulic hoses

Durable but highly flexible thermoplast hydraulic hoses guarantee a very long life.
The 4-layer build-up includes 2 layers of high tensile steel fabric and robust fitting with 19 mm hexagon.
The volumetric expansion is very low.
Hydraulic hoses model HHC...are equipped with a male coupler half as standard.
Standard length are as per the chart below, further lengths or hoses with larger diameters are quoted on request.

Safety factor : 4:1 (burst pressure 2800 bar)
Outer diameter : approx. 14,0 mm
Bend radius min.: 100 mm
Nominal width : 6,3 mm

Model	Length m	Width mm	Pressure max. bar	Connection 1 thread nipple 3/8-NPT, outer	Connection 2 male coupler half CMY - 1
HHC - 5	0,5	6,3	700		
HHC - 10	1,0	6,3	700		
HHC - 20	2,0	6,3	700		
HHC - 30	3,0	6,3	700		
HHC - 40	4,0	6,3	700		
HHC - 60	6,0	6,3	700		
HHC - 80	8,0	6,3	700	hose end to be screwed into pumps, valves, manifolds etc. (pump side)	hose end with male coupler half to be connected to female coupler half of hydraulic cylinder
HHC - 100	10,0	6,3	700		
HHC - 120	12,0	6,3	700		
HHC - 150	15,0	6,3	700		

How to order

Hydraulic hose for all standard combinations (- pump - hose - cylinder -)
Order a standard hose with female coupler half model HHC... (e.g. HHC - 20)

Hydraulic hose for coupling connections on both sides (both ends with CMY - 1)
Order a complete coupler CCY - 1 in addition to a standard hose model HHC... (recommended for long hydraulic hoses).

Hydraulic hose with flexible steel protection
Under model: “HHCC - ... flex“ we offer fully protected hoses with male coupler half CMY - 1 at both ends.
Recommended to protect hydraulic hoses from heat, grinding dust or welding spatter (please advise length of hose).

Hydraulic extension hose (one male coupler half, one female coupler half)
Order a female coupler half CFY - 2 (inner thread) in addition to a standard hose model HHC...

Hydraulic hose without any coupler parts (both ends with threaded nipples)
Order model HH... (both ends 3/8-NPT outer)

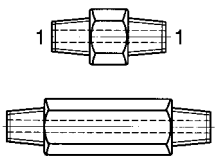
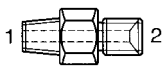
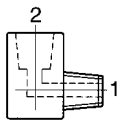
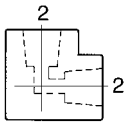
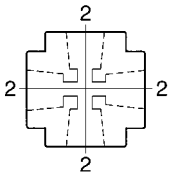
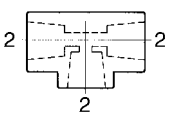
Yale®

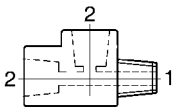
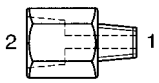
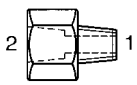
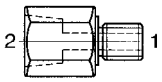
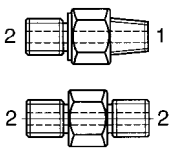
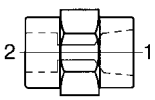
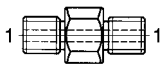
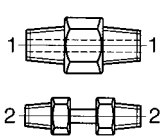
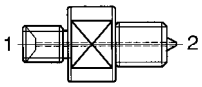
High pressure fittings

FY

Fittings, reducers, connectors

Yale high pressure fittings have been designed to give a variety of connections, extensions and combinations.
The fittings are designed for a max system pressure of 700 bar.
For improved sealing of NPT connections use 2 layers of teflon tape and tighten accordingly.

Model		Description		Connection 1		Connection 2	
FY - 1 **FY - 1L**		Double nipple Double nipple, long		3/8 NPT	outer	–	
FY - 13 **FY - 17** **FY - 18**		Double nipple Double nipple Double nipple		1/4 NPT 3/8 NPT 3/8 NPT	outer outer outer	R 1/4 M14 x 1,5 R 1/4	outer (for sleeve nut) outer
FY - 2		Elbow		3/8 NPT	outer	3/8 NPT	inner
FY - 3		Elbow		–		3/8 NPT	inner
FY - 6		Cross		–		3/8 NPT	inner
FY - 4		Tee		–		3/8 NPT	inner

Model		Description		Connection 1		Connection 2	
FY - 5		Tee		3/8 NPT	outer	3/8 NPT	inner
FY - 7 **FY - 11**		Connection Connection		– –		3/8 NPT 1/4 NPT	inner inner
FY - 8 **FY - 9**		Adaptor Adaptor		3/8 NPT 1/4 NPT	outer outer	R 1/2 3/8 NPT	inner inner
FY - 10 **FY - 12**		Adaptor Adaptor		3/8 NPT 1/2 NPT	outer outer	1/4 NPT 3/8 NPT	inner inner
FY - 16 **FY - 19** **FY - 20** **FY - 30** **FY - 33**		Adaptor Adaptor Adaptor Adaptor Adaptor		3/8 NPT M18 x 1,5 M14 G 3/8 3/8 NPT	outer outer outer outer outer	M18 x 1,5 3/8 NPT 3/8 NPT 3/8 NPT M14 x 1,5	inner inner inner inner inner
FY - 26 **FY - 27**		Double nipple Double nipple		3/8 NPT G 3/8	outer outer	G 3/8 G 3/8	outer outer
FY - 31 **FY - 32**		Connection Connection		3/8 NPT 3/8 NPT	inner inner	M18 x 1,5 M20 x 1,5	inner inner
FY - 35		Double nipple		M 14	outer	–	–
FY - 703		Connecting set for 4/3 way valve to HPS hand pumps (telescopic nipple)		3/8 NPT	outer	1/4 NPT	outer
FY - 201		Hose connector for TWZ hand pumps 2000 bar		R 1/4	outer	M22 x 1,5 (with seal cone)	outer