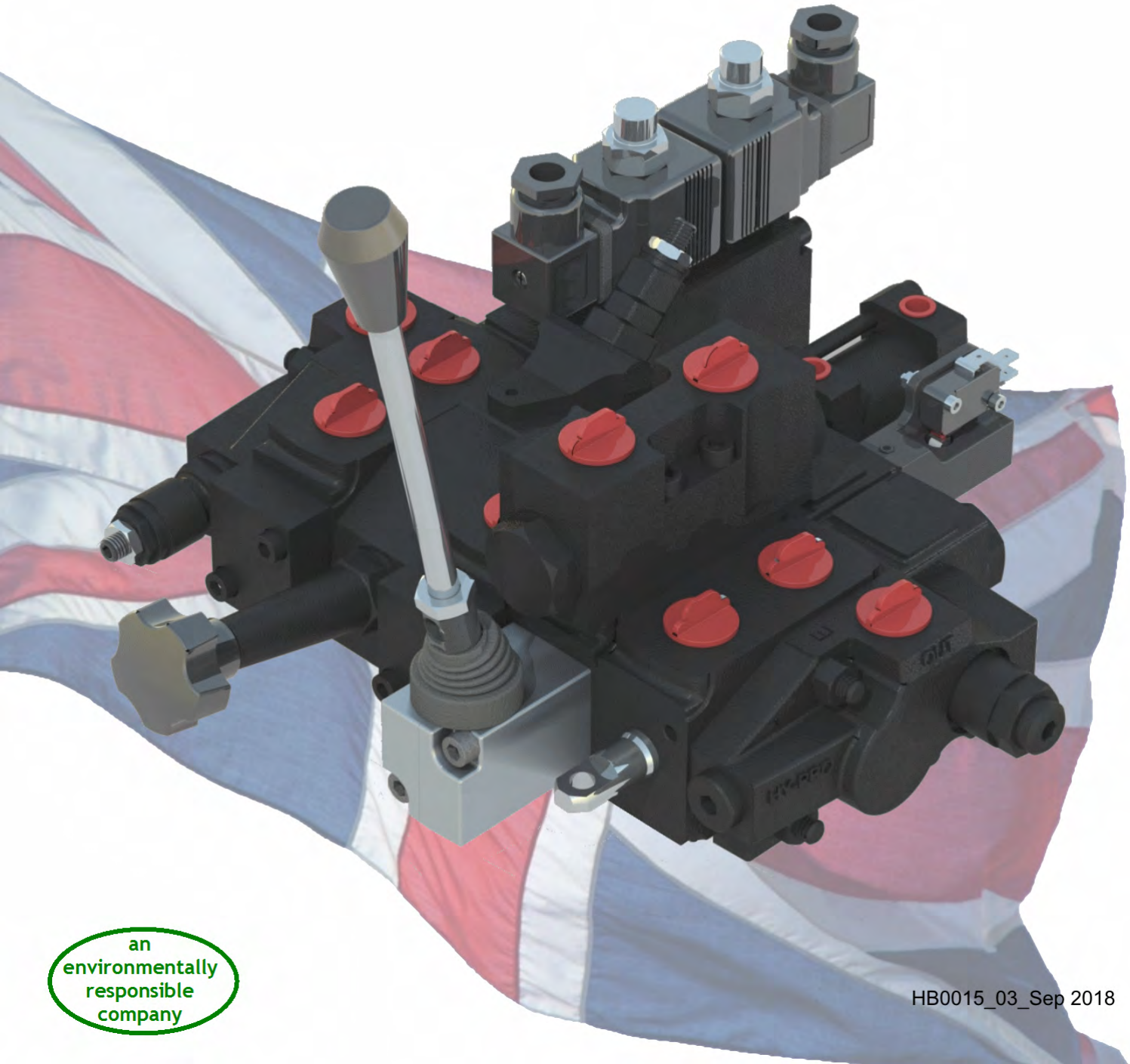
Hy-Pro

motion and control solutions

Hydraulic Directional Control Valve Catalogue



an environmentally responsible company

HB0015_03_Sep 2018

CONTENTS

Hy-Pro
motion and control solutions

WHO WE ARE

Hydraulics Engineering Quality and Manufacturing Excellence

Who are we?

Since 1967 Hydraulic Projects has been designing and manufacturing hydraulic valves and hydraulic marine autopilots steering equipment from our UK base. With our own in house computer aided design linked to the latest CNC machines, we control the complete process from initial concept through assembly and test to ISO 9001 we guarantee the product to the very highest quality delivered on time.

What do we do?

We manufacture a large range of hydraulic directional control valves supplemented by ancillary valves such as pilot check, service line relief's etc. Additionally, we produce a range of marine autopilot hydraulic steering equipment. We can also tailor our designs to suit your requirements.

Who are our customers?

You will find our valves on a vast range of equipment from recovery vehicles to refuse wagons, industrial jigs and fixtures, agricultural machinery, construction and plant equipment, boat winches and many other applications.

Now what do you do?

Just look through our catalogue or browse our web site www.hypro.co.uk for your directional control valves requirements. Or call us to discuss your circuit needs and we will be happy to help you choose the correct valve for your application.

So how can we help you?

Our contact details are shown on the back cover of this catalogue and our dedicated sales team are waiting to take your call.

Ordering

We are happy to accept orders by phone, fax email or post. Please use the catalogue order codes where possible. If you can't see what you require please contact us as our range goes beyond what is printed here. Please check and confirm availability of items before ordering.

Shipping

We use a national carrier for most orders or 1st class post for smaller items where appropriate. Alternatively you may arrange your own collection but there will be a small packing charge.

Payment

Payment can be made by credit/debit card, cheque or bank transfer. New accounts are strictly on a profoma basis. Credit accounts are available on application and subject to the usual credit checks.

A copy of our full terms and conditions is available on request or alternatively can be viewed or downloaded from our website.

Hy-Pro
motion and control solutions

IMPORTANT INFORMATION

Any samples or weights, measurements, capacities or other particulars contained in illustrations or descriptive material, including information contained in the Hydraulic Projects Ltd's brochures, website, advertising material or elsewhere, shall not form part of the contract and shall be treated as approximate and for guidance only unless specifically stated otherwise. Hydraulic Projects Ltd may at its discretion from time to time vary the design of the Goods from that advertised. The buyer shall be responsible to Hydraulic Projects Ltd for ensuring the accuracy of the terms of any order including any applicable specification and for giving Hydraulic Projects Ltd any necessary information relating to the Goods. Hydraulic Projects Ltd assumes no responsibility for ascertaining that the Goods are suitable and sufficient for the buyer's purposes.

A copy of our full terms and conditions can be found at www.hypro.co.uk

 This catalogue supersedes all previous issues.

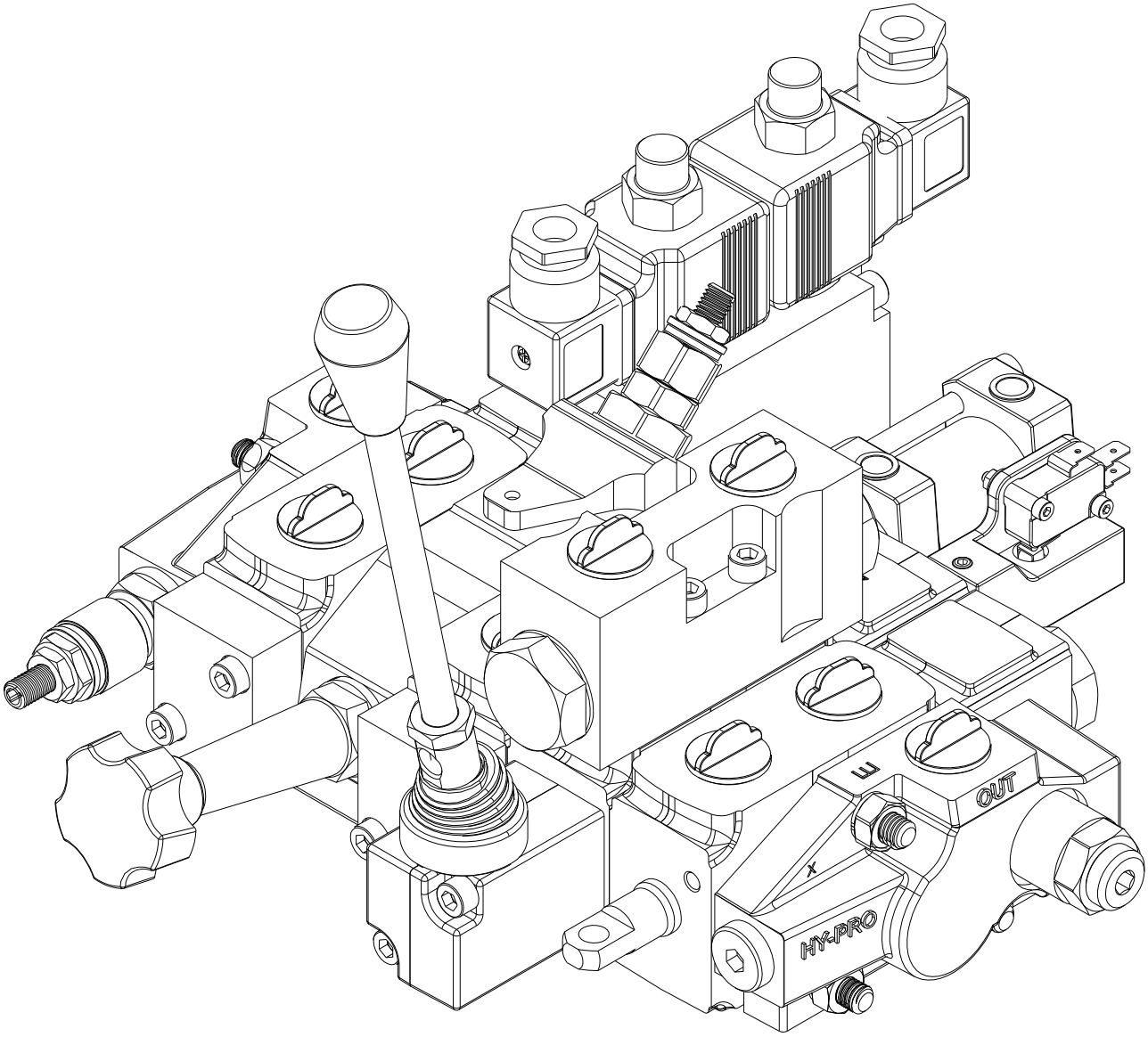
TECHNICAL DATA

The following data applies to all Hy-Pro sectional and line mounted valves except where otherwise stated:

Maximum pressure	250 bar 210 bar (assemblies containing solenoid sections)
Maximum back pressure	25 bar
Temperature rating minimum	-20°c
Temperature rating maximum	+65°c
Recommended fluid type	Mineral based hydraulic ISO VG37
Fluid cleanliness	≥ ISO 19/14/11
Materials	
Cast Iron	BS 1452-250
Aluminium manifolds	BS 1490
External protection	
Stainless steel	BS 10088-3
Steel	Zinc chromate BS 1706 Zn3 Nitrotech NQ3 Black paint HTS1006
Seals	
Static	Nitrile
Reciprocating	Viton
Spool High Pressure	PTFE
Anti-extrusion rings	PTFE
Relief valves	Unless otherwise requested set 'full open' at 20 L/min / ISO VG37 @ 30 to 40 degrees C
Service line relief valves	Unless otherwise requested are set at 'crack' ISO VG37 @ 30 to 40 degrees C
Electrical	
Coil Voltage	12/24 VDC
Coil power	24W
Protection	IP67
Connection	DIN 43650
Cable Ø (not supplied)	6 - 8mm
Pneumatic supply	5-10 bar

Hy-Pro
motion and control solutions

V4-40 & V5-60 DIRECTIONAL CONTROL VALVE



Hy-Pro
motion and control solutions

V4-40 & V5-60 DIRECTIONAL CONTROL VALVE

DESCRIPTION

A low parallel connected sectional spool valve, lever, solenoid, pneumatic or cable operated. Suitable for open or closed centre series circuits. Spool mechanisms for 2, 3 & 4 position valves, all with excellent metering characteristics and with fine metering spools also available.
Direct acting or pilot operated main relief valves can be incorporated into the inlet cover. Extensive range of lever options, inter-sections, solenoid sections and ancillaries are available.

On the solenoid sections the internal oil pilot system is switched by solenoid operated cartridges using compact 24-Watt DC coils. A damping orifice fitted in the pilot line eliminates the harshness associated with standard direct acting solenoid valves, giving a positive feel to the control system. Solenoid sections can be built in to a valve assembly containing manual sections and any of the extensive range of ancillary valves.

Application

Designed to be used in many applications requiring a compact, rugged sectional spool valve and suitable for use in the industrial, mobile, marine and agricultural markets. Using the comprehensive range of options, a valve bank can be assembled to control a variety of hydraulic circuits.

Features

- Excellent metering characteristics.
- Excellent load holding.
- Integral load check valve.
- Open and closed centre assemblies.
- Direct acting or piloted adjustable relief valves.
- Robust enclosed lever mechanism.
- Extensive range of ancillaries and intersections.
- Open and closed centre options.
- 100% production testing.

As well as the above the solenoid valves further feature

- 12 and 24V DC 24 Watt Coils
- Soft spool action.
- Manual and solenoid sections together in the same bank.
- Lever override option.

V4-40 & V5-60 OPERATING CONDITIONS

Maximum pressure	250 bar
	210 bar*
Maximum back pressure	25 bar

* Assemblies with solenoids

Rated flow V4-40	40 L/min
Rated flow V5-60	60 L/min

Spool leakage @ 210 bar 20ºc A/B

Standard Spools	<6cc/min
4 Position Spools	<8cc/min

Materials
Cast Iron BS1452-250
Aluminium BS1490
Spools Case Harden BS6507
Tie studs BS970/191 817M40T

Tie stud torque 13.5Nm

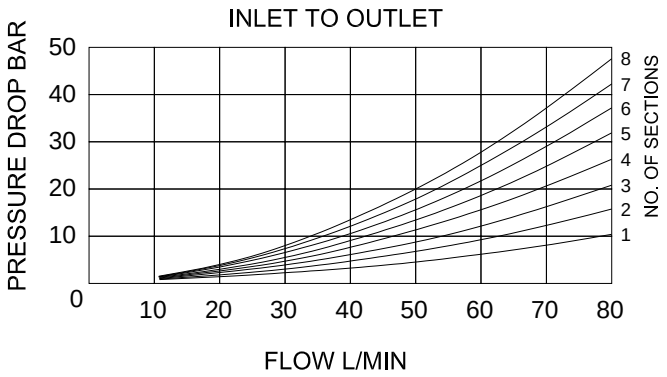
External protection
Black Paint to HTS1006

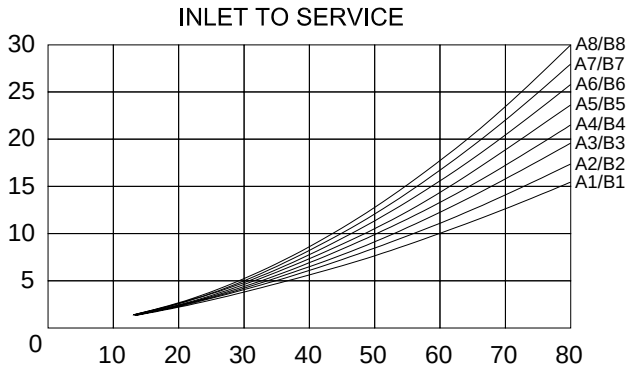
Steel Parts
Zinc chromate BS 1706 Zn3
Nitrotech NQ3

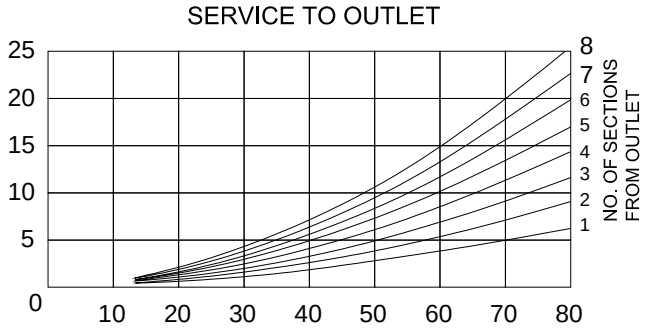
Seals static	Nitrile
Reciprocating	Viton
Spool High Pressure	PTFE
Anti extrusion	PTFE

Electrical

Coil Voltage	12 or 24VDC
Max cont. Voltage	12V = 13.8V
	24V = 27.5V
Coil Power	24W
Protection	IP67
Connection	DIN 43650
Cable Ø	6 - 8mm
(not supplied)	

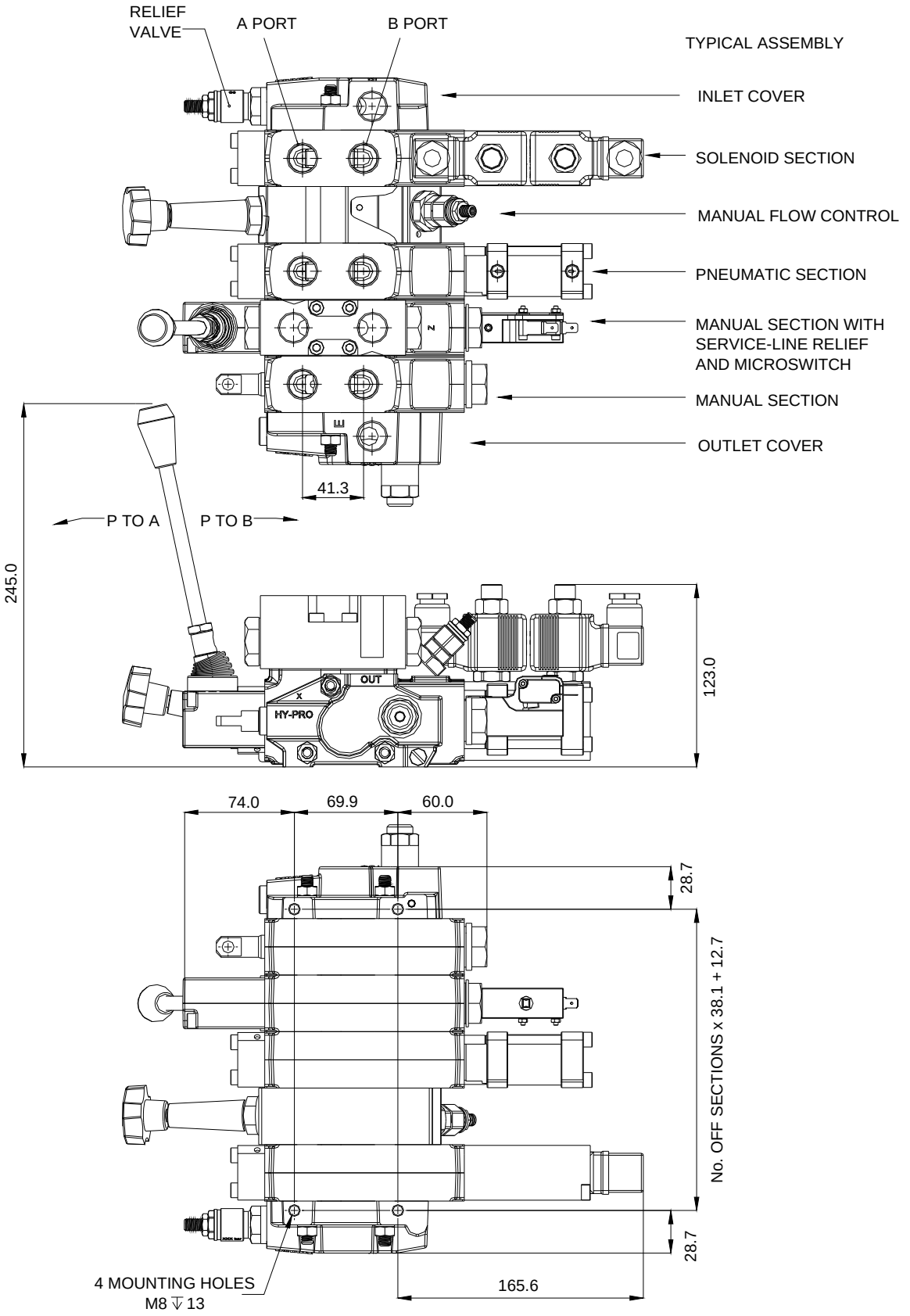






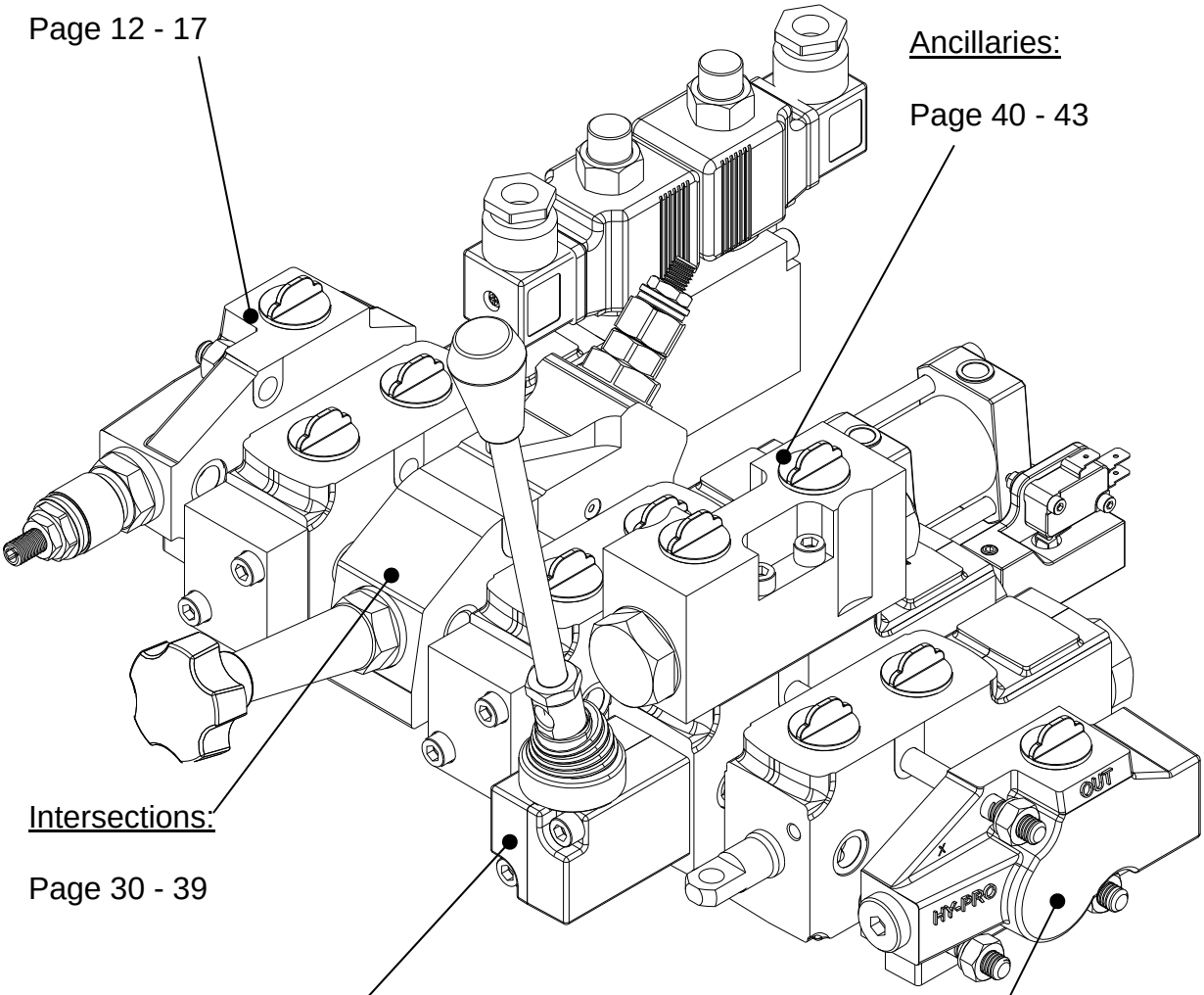
Hy-Pro
motion and control solutions

V4-40 & V5-60 INSTALLATION DETAILS



Hy-Pro
motion and control solutions

V4-40 & V5-60 CONTENTS



Hy-Pro
motion and control solutions

V4-40 & V5-60 INLET COVERS

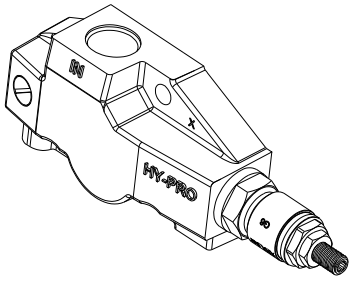
STANDARD INLETS

The inlet covers come with G(BSP) ports in either top or side positions.
They can be fitted with or without a relief valve. They are supplied in open centre configuration as standard but can be specified for use in closed centre systems.

If a solenoid spool section is used in the assembly an ‘E’ type inlet is used which contains additional drillings for the pilot connections.

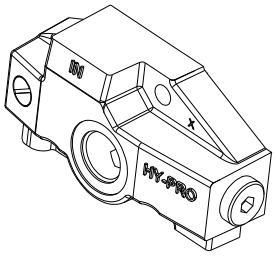
We can also include an auxiliary port for fitment of a pressure gauge.

Top port

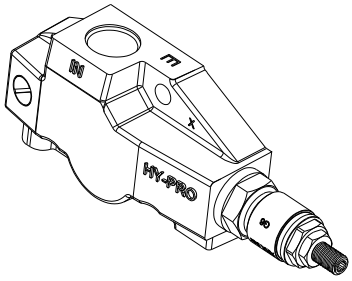


Relief Valve

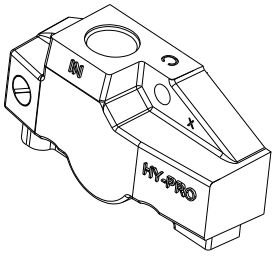
Side port



Solenoid
Top Port



Closed centre
Top Port



Relief Valve
Adjustable.
Pilot Operated or Direct Acting.

Material Cast Iron
Weight 0.75kg

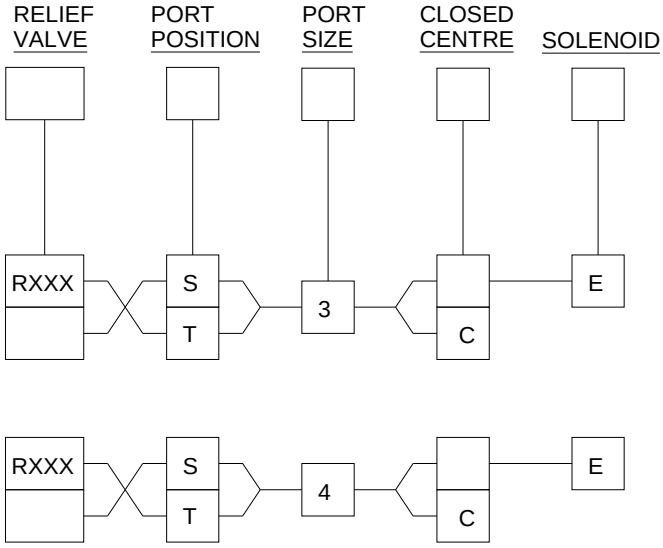
Hy-Pro
motion and control solutions

V4-40 & V5-60 INLET COVERS

Option	Code
Relief valve	RXXX
Side port	S
Top port	T
Port size G3/8	3
Port size G1/2	4
Closed centre*	C
Solenoid	E

‘XXX’ = relief valve setting in bar.

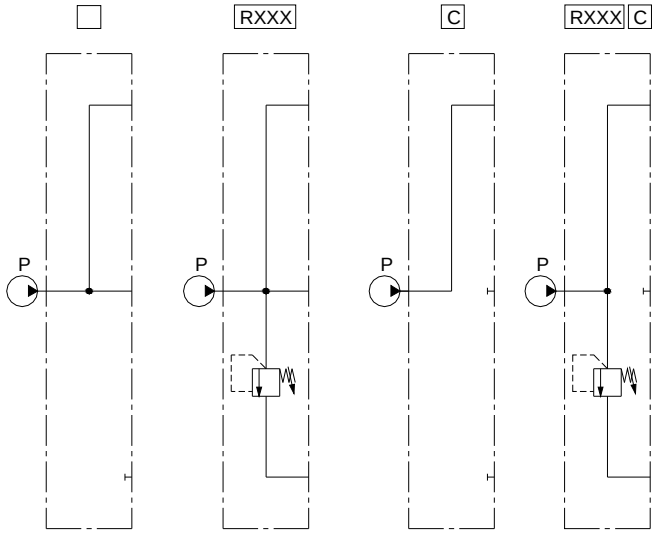
* On solenoid valves the closed centre is made at the outlet cover.



Example codes

R190	T	3		Relief Valve set 190 Bar with G3/8 Top port
R140	T	4		Relief Valve set 140 Bar with G1/2 Top port
R140	T	4	E	Relief Valve set 140 Bar with G1/2 Top port for solenoid sections
	T	4	C	No Relief Valve, G1/2 Top port Closed centre

Solenoid pilot drillings omitted for clarity



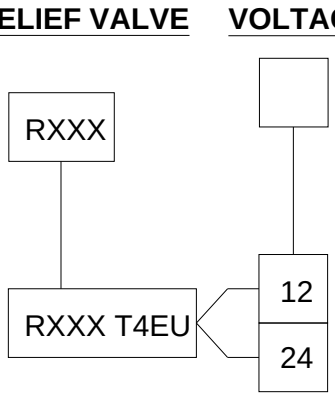
No Relief Valve | With Relief Valve | Closed Centre | Closed Centre with Relief Valve

Hy-Pro
motion and control solutions

V4-40 & V5-60 INLET COVERS

INLET WITH FLOW SOLENOID UNLOADER

Option	Code
Relief valve	RXXX
Top G1/2 Port	T4
Solenoid	E
12VDC	12
24VDC	24

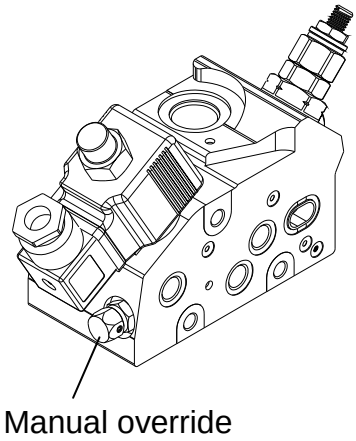


'XXX' = relief valve setting in

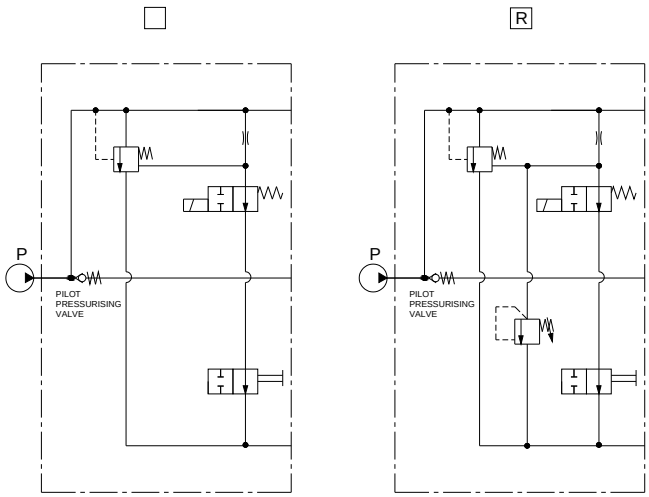
Example code

R210	T4E U	24

Relief Valve set 140 Bar, 24VDC



This special inlet includes the pilot pressurising valve for solenoid sections so is used with a standard outlet cover.



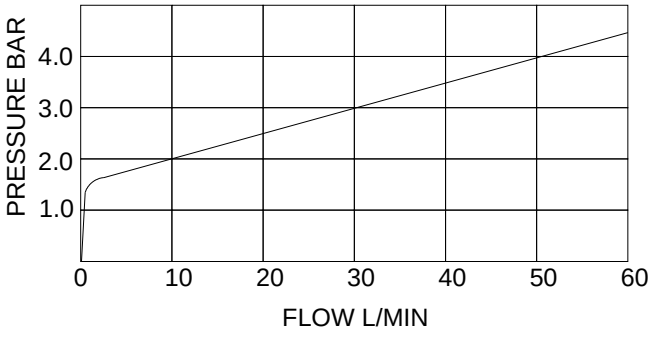
Unloader
NO Normally open
Unloads P to T unless energised

Relief Valve
Adjustable. Pilot Operated

Manual Override
Screw in to operate

Body	Aluminium
Weight	1.7kg
Width	N/a

TYPICAL PRESSURE DROP UNLOADED

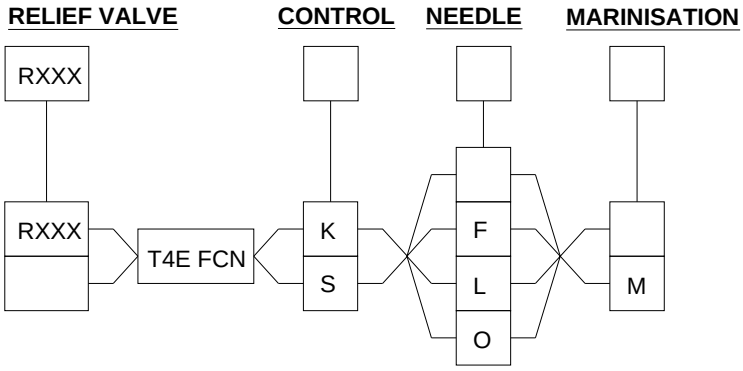


Hy-Pro
motion and control solutions

V4-40 & V5-60 INLET COVERS

INLET WITH FLOW CONTROL

Option	Code
Relief valve	RXXX
Top G1/2 Port	T4
Solenoid	E
Handwheel	K
Screw & lock nut	S
Standard needle	
Fine needle	F
1 Turn needle	L
No shut off needle	O
Marinised	M



'XXX' = relief valve setting in bar.

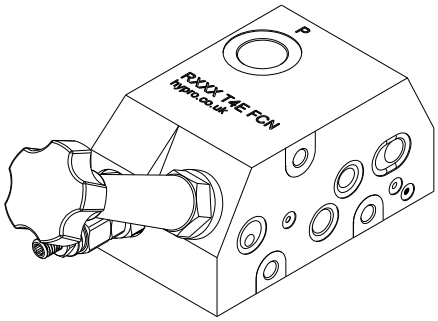
Example codes

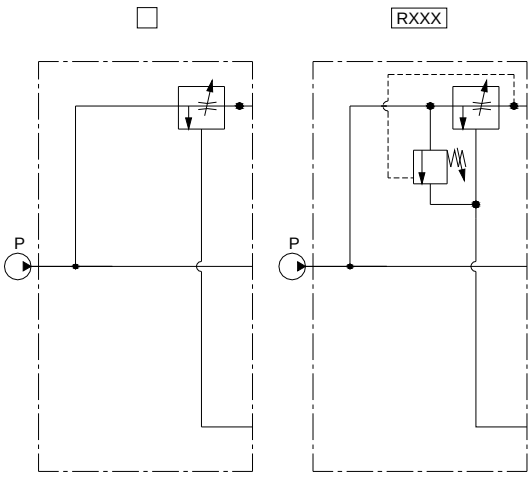
R140	T4E	FCN	K		

Relief Valve set 140 Bar, Standard needle & handwheel

R140	T4E	FCN	S	F	M

Relief Valve set 140 Bar, Fine needle, Screw adjusted & Marinised





Adjustable range 0-60 L/min
ΔP Inlet to outlet 40 L/min 0.6 bar
ΔP Inlet to service 40 L/min 4.6 bar

Relief Valve
Adjustable. Pilot Operated

Mounting 2x M8x1.5p-6H
Body Aluminium
Weight 2.0kg

Hy-Pro
motion and control solutions

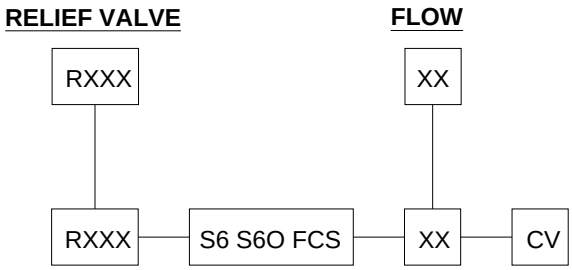
V4-40 & V5-60 INLET COVERS

INLET WITH FLOW CONTROL (100L/min)

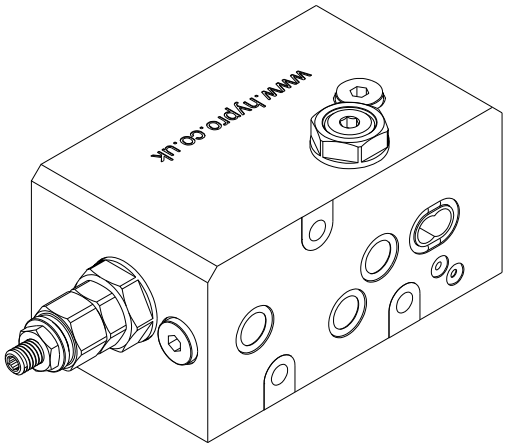
This special unloading inlet cover maintains 60 L/min to the valve regardless of the inlet flow (up to a maximum of 100 L/min.

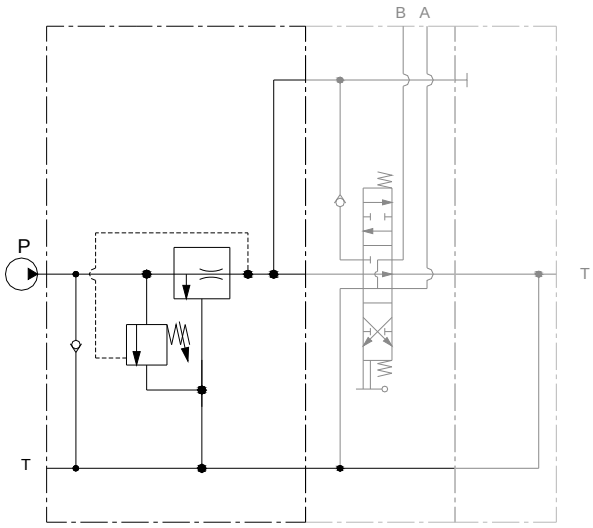
Excess flow is returned to the outlet port.

Features internal check valve for reverse connection protection.



'XXX' = relief valve setting in bar.





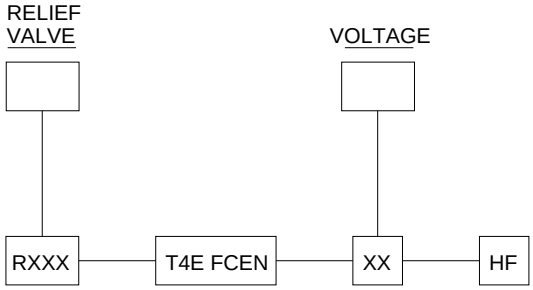
Input flow	100L/min Max
Output flow	60L/min
Ports	Inlet G3/4 Outet G3/4
Relief Valve	Adjustable. Pilot Operated
Body	Aluminium
Weight	2.0kg

Hy-Pro
motion and control solutions

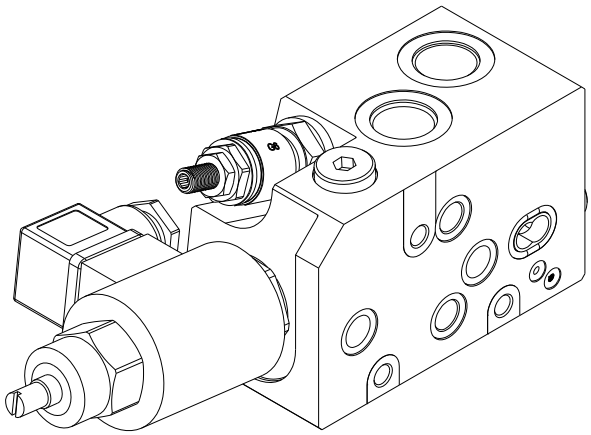
V4-40 & V5-60 INLET COVERS

INLET WITH PROPORTIONAL FLOW CONTROL

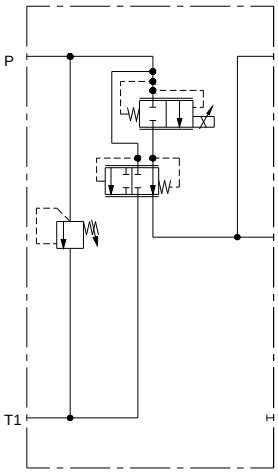
This special inlet includes its own return line which is separate from the adjacent spool sections and must be connected to tank.



'XXX' = SETTING IN BAR
'XX' = 12 OR 24VDC



Adjustable range 0-60 L/min
Voltage 12 or 24VDC



Relief Valve
Adjustable. Direct Acting.

Mounting 2x M8x1.5p-6H
Body Aluminium
Weight 2.0kg

Hy-Pro
motion and control solutions

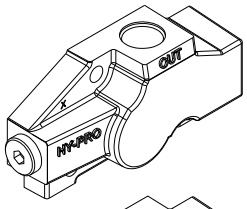
V4-40 & V5-60 OUTLET COVERS

STANDARD OUTLETS

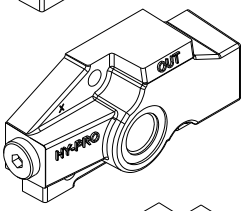
The outlet covers come with G (BSP) ports in either top or side positions. Pressure Carry Over is available by selection of an alternative outlet cover.

If a solenoid spool section is used in the bank an ‘E’ type outlet is used which contains the pilot pressurising valve and the additional drillings for the connections. Note that if a combined inlet/unloader is fitted the ‘E’ type outlet is not required.

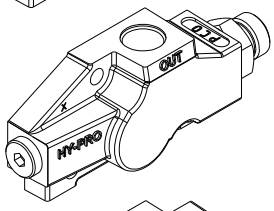
Top port



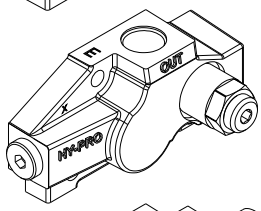
Side port



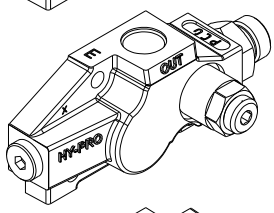
Pressure Carry Over



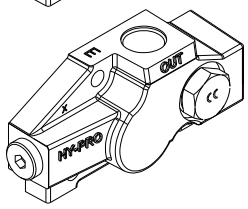
Solenoid



Solenoid Pressure Carry Over



Solenoid Closed Centre

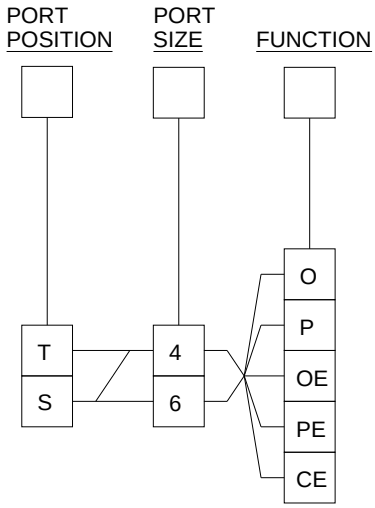


Body	Cast Iron
Weight	0.8kg

Hy-Pro
motion and control solutions

V4-40 & V5-60 OUTLET COVERS

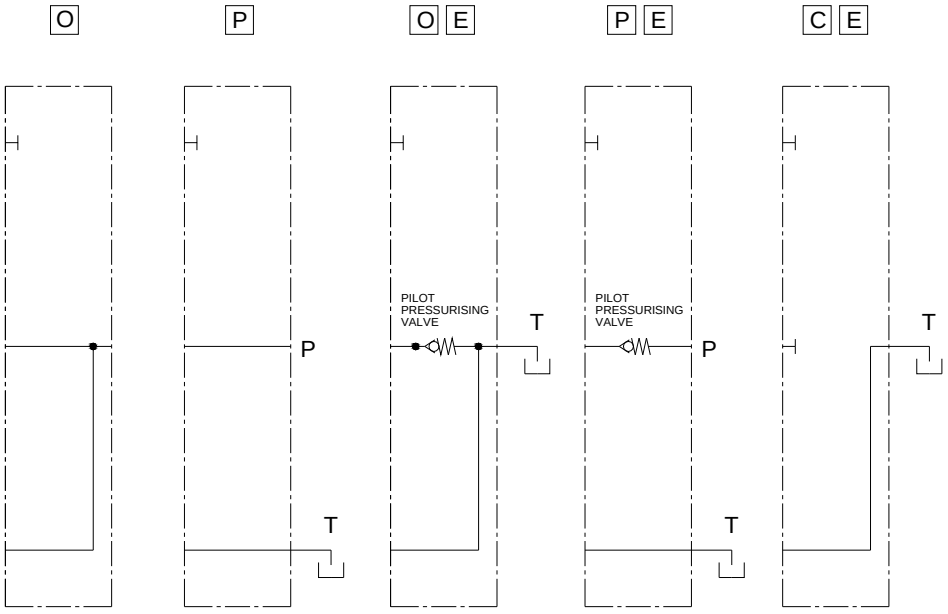
Option	Code
Top port	T
Side port	S
G1/2 Port	4
G3/4 port	6
Outlet	O
Pressure Carry Over	P
Outlet - solenoid	OE
Pressure Carry Over - Solenoid	PE
Closed Centre - Solenoid	CE



Example codes

T	3	O	G3/8 Top port
S	6	P	G3/4 Side port and Pressure Carry Over
T	4	OE	G1/2 Top port for Solenoid sections
T	4	CE	G1/2 Top port, Closed centre for Solenoid sections

Pilot drillings omitted for clarity



Outlet	Outlet with PCO	Outlet for Solenoid Sections	Outlet with PCO for Solenoid Sections	Outlet Closed Centre for Solenoid Sections

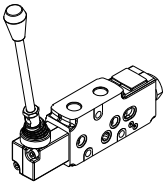
Hy-Pro
motion and control solutions

V4-40 & V5-60 WORKING SECTIONS

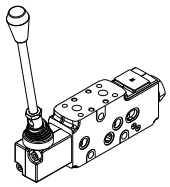
DESCRIPTION

The V4-40 and V5-60 working sections have family of spools to suit most applications. There are standard or fine metering options and 2, 3 and 4 position detent / spring centring mechanism combinations.
Actuation options are manual levers – standard / rotary / dual axis (x & +), cable, direct link to the spool, pnuematic or pilot solenoid (with or without manual lever override).
The standard manual lever assembly has four orientation options and is universal across the range. Lever knobs are available in a variety of colours.
Spool operated single or twin V3 series micro-switch assembles can be fitted to manual sections with the option of IP67 environmental protection.
Body options consist of standard threaded ports or an interface for the fitment of ancillary valves.

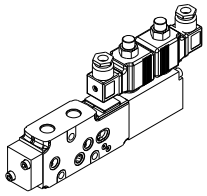
V4-40



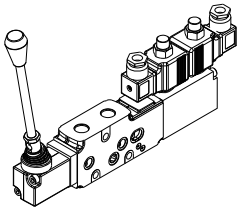
Manual



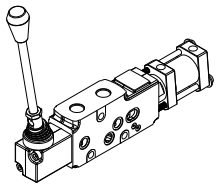
Interface



Solenoid

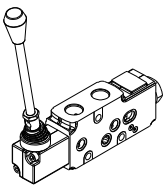


Solenoid with Lever Override

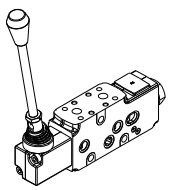


Pneumatic with Lever Override

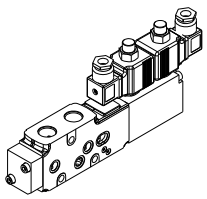
V5-50



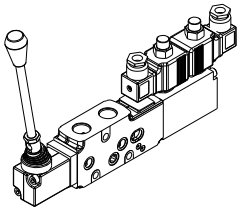
Manual



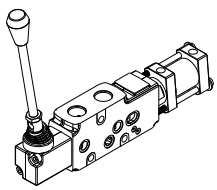
Interface



Solenoid



Solenoid with Lever Override



Pneumatic with Lever Override

Hy-Pro
motion and control solutions

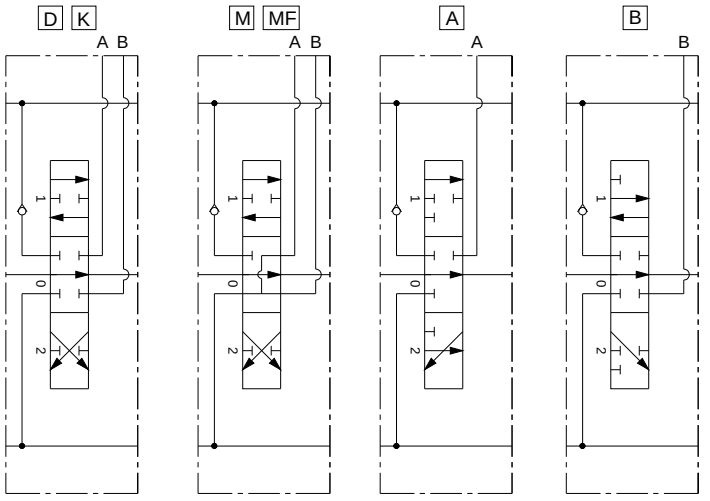
V4-40 & V5-60 WORKING SECTIONS

SPOOL OPTIONS

Manual	Code
Cylinder	D
Cylinder - fine metering	K
Motor	M
Motor - fine metering	MF
Single acting A port	A
Single acting B port	B
4 Position float	4
Regenerative	R
Unloading (Dead mans handle)	P

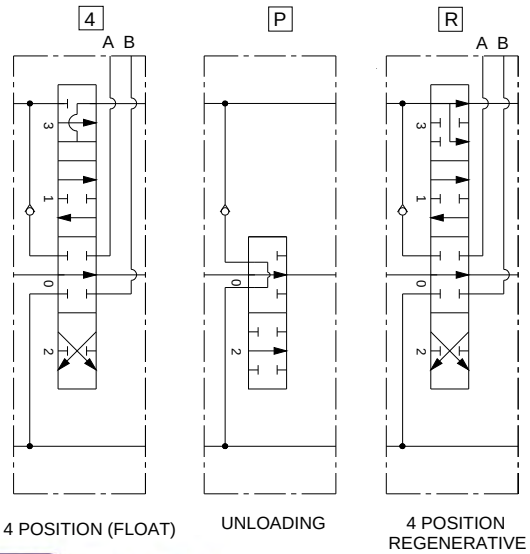
Solenoid	Code
Cylinder	D
Motor*	M
Single acting A port	A
Single acting B port	B

Pneumatic	
Cylinder	D
Motor	M
Single acting A port	A
Single acting B port	B



*For flows <5 L/min please contact us.

SOLENOID PILOT LINES OMITTED FOR CLARITY



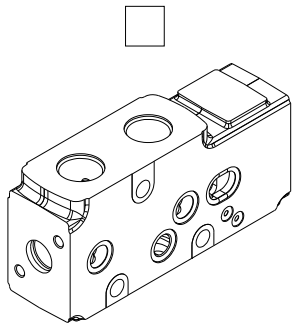
Hy-Pro
motion and control solutions

V4-40 & V5-60 WORKING SECTIONS

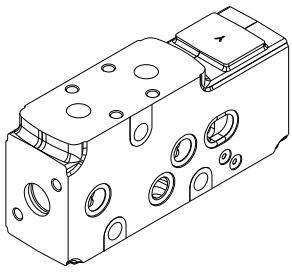
BODY OPTIONS

Body options are available with standard G (BSP) ports or with an ancillary interface to facilitate the fitment of Pilot Check, Service Line Relief or Solenoid 4th Position manifolds.

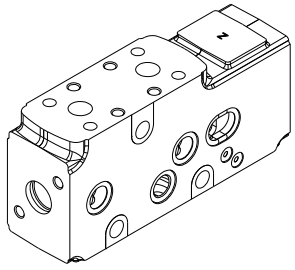
Option	Code
Standard ports	-
Ancillary interface - Pilot check	Y
Ancillary interface - Service relief	Z



Y



Z



Material	Cast Iron
Weight	2.0kg Manual 2.5 kg Solenoid
Width	38.1mm

Hy-Pro
motion and control solutions

V4-40 & V5-60 WORKING SECTIONS

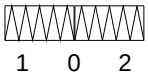
SPOOL POSITIONING OPTIONS

2, 3 and 4 position centring mechanisms in a combination of spring return and detent location.

Manual	**Code**
Spring - 3 Position	C
Spring - 2 position P-B	2C
Detent - 3 Position	L
Detent - 2 position P-B	2L
Detent - 2 position P - A	2Li
Detent friction - 3 Position	O
Spring / Detent - 3 Position	F
Float - 4 Position	4C
Detent - 4 position	4L
Solenoid	
Solenoid - 3 Position	E
Solenoid - 2 position	2E
Pneumatic	
Pneumatic - 3 Position	P
Pneumatic - 2 position	2P

Spring - 3 Position

C

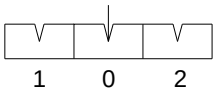


Spring - 2 Position P to B

2C

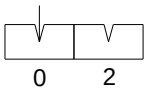
Detent - 3 Position

L



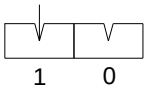
Detent - 2 Position P to B

2L



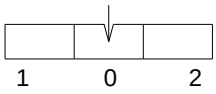
Detent - 2 Position P to A

2Li



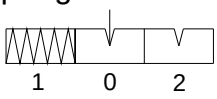
Detent Friction - 3 Position

O



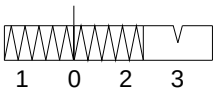
Spring / Detent - 3 Position

F



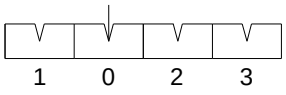
Float - 4 Position

C



Detent - 4 Position

L



Solenoid - 3 Position

E

Solenoid - 2 Position

2E

Pneumatic - 3 Position

P

Pneumatic - 2 Position

2P

Hy-Pro
motion and control solutions

V4-40 & V5-60 WORKING SECTIONS

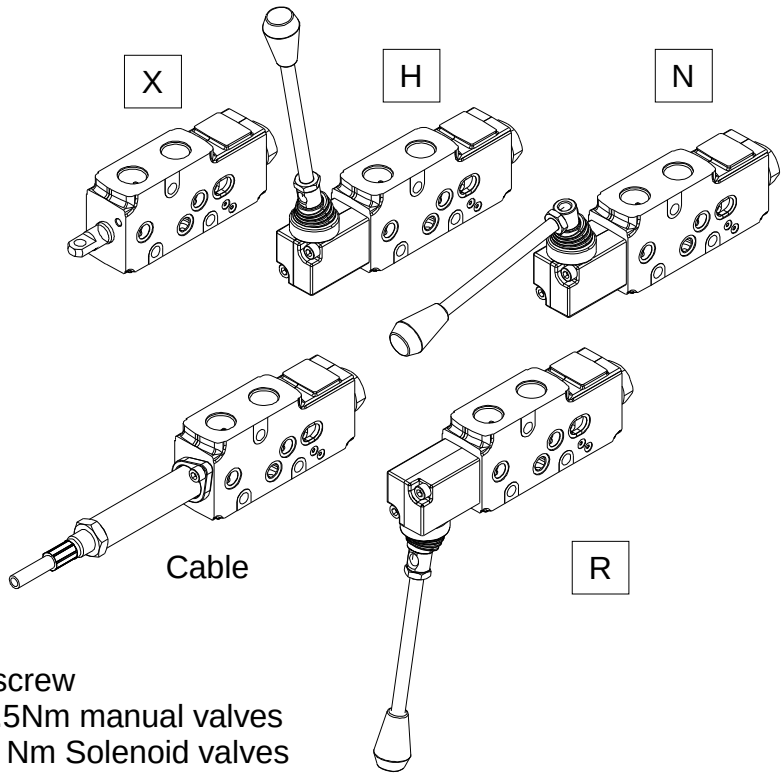
CONTROL OPTIONS - STANDARD LEVER & CABLE

The standard lever is common across the sectional valve range. It can be supplied as standard or with environmental protection.

A further option on manual and solenoid sections is to have the lever fitted 'sideways' on - contact us for details.

Option	Code
No Lever*	X
No Lever - solenoid sections	-
Standard Lever	H
Standard Lever - 90º	N
Standard Lever - Reversed	R

* For cable operation select code X. The mounting holes for the lever accept a standard 'Morse' type cable.



Fixing 2x M6 Cap screw
Torque - 13.5Nm manual valves
8 Nm Solenoid valves

Knob Black standard,
Red, Blue, Green,
Yellow or Ident' type

Body Aluminium LM24TF
Fasteners Deltatone
Weight 0.3kg

Hy-Pro
motion and control solutions

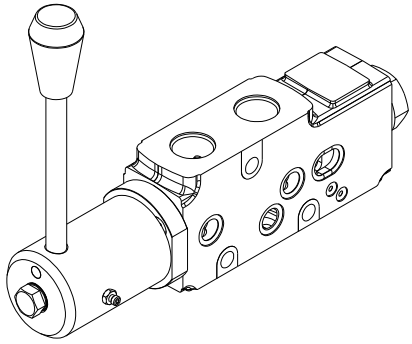
V4-40 & V5-60 WORKING SECTIONS

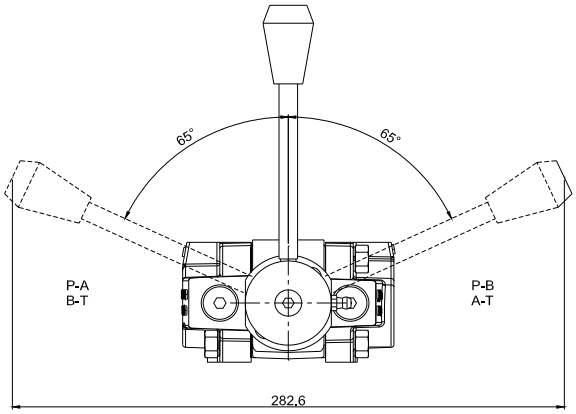
CONTROL OPTIONS - ROTARY LEVER

Used extensively in the forestry and fishing industry to control the speed of conveyors and winches. The Hy-Pro rotary lever has been developed specifically to enable the operator precise control of motors and cylinders. The lever rotates through a ± 65° arc and operates a scroll which converts the rotary action of the lever into axial movement of the spool.
The mechanism has a friction detent feature which positively holds the spool in neutral or will maintain the selected position when operated.
Because of the geometry of the lever it is not possible to include it in multi-section valves but it is a retro-fit to existing single section assemblies.

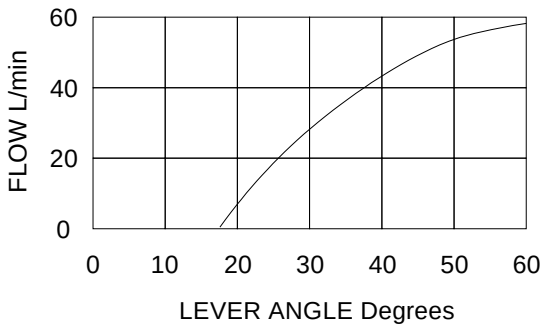
Refer to page 29 for full ordering code.

ROTARY LEVER





TYPICAL METERING CHARACTERISTIC



Body	Manganese bronze CZ114
Lever	Stainless steel
Weight	2.0kg
Width	N/a

Hy-Pro
motion and control solutions

V4-40 & V5-60 WORKING SECTIONS

CONTROL OPTIONS - MULTI AXIS

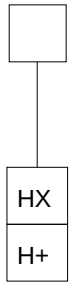
The V4 and V5 dual axis levers operate two sections either simultaneously or individually, allowing the operator to have total control of two sections using 360 degrees of movement.

The H+ version controls section one in the north and south planes and section two in the east and west . Combinations of movement are achieved between these points.

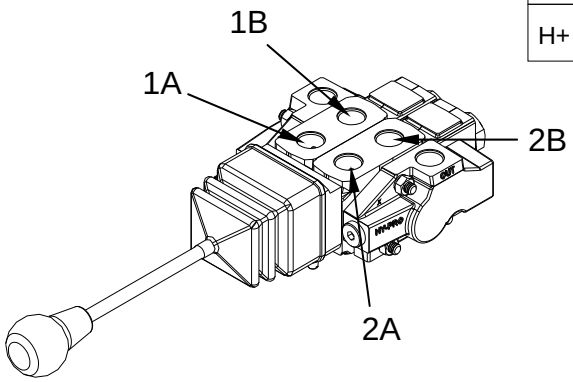
The Hx version controls both sections in the north, south, east and west planes and individual sections between these points.

Refer to page 29 for full ordering code.

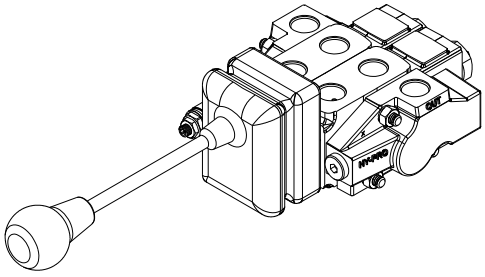
MULTI AXIS



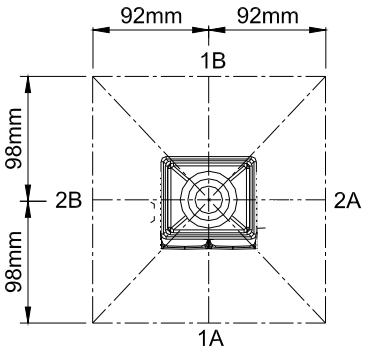
H+



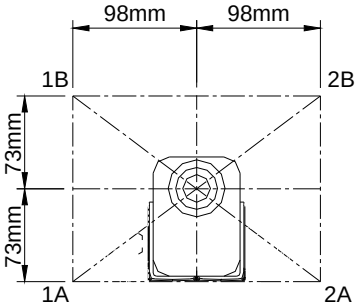
Hx



H+



Hx



Minimum operating Force	
One spool	2.5 kg
Two spool	5.0 kg
Body	Aluminium
Pivots	Carburised steel
Width	N/a

Hy-Pro
motion and control solutions

V4-40 & V5-60 WORKING SECTIONS

ENVIRONMENTAL PROTECTION OPTIONS

The valves are available with a marinised finish to withstand harsh environments. It comprises black anodised lever housings with stainless steel handles and locknuts. For further protection such as in marine applications the spool can be supplied with electro-less nickel plating.

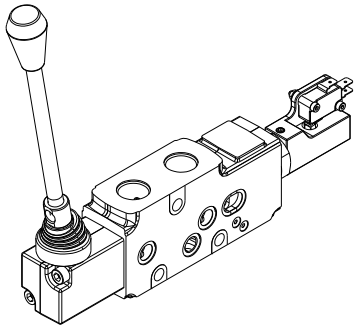
Refer to the order and example codes on pages 28 and 29.

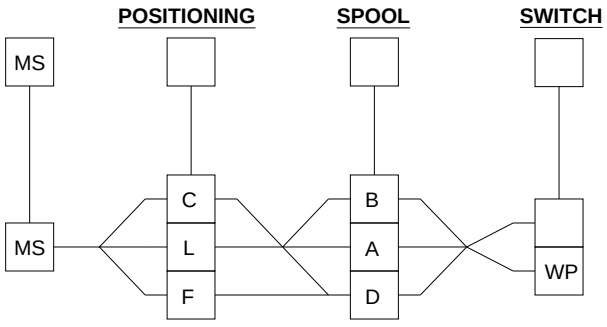
	Code
Standard	-
Stainless steel lever & Anodised housing	S
Stainless steel lever, Anodised housing & Nickel plated spool	M

WORKING SECTIONS - MICRO-SWITCH OPTIONS

The V4-40 and V5-60 ranges can be fitted with a micro-switch to enable the activation of auxiliary functions with spool operation.

Micro-switch Options	**Code**
Spring centred	C
Detent	L
Spring/Detent	F
Main spool S/Acting B	B
Main spool S/Acting A	A
Main spool D/Acting	D
Standard V3 Switch	-
IP67 V3 Switch	WP



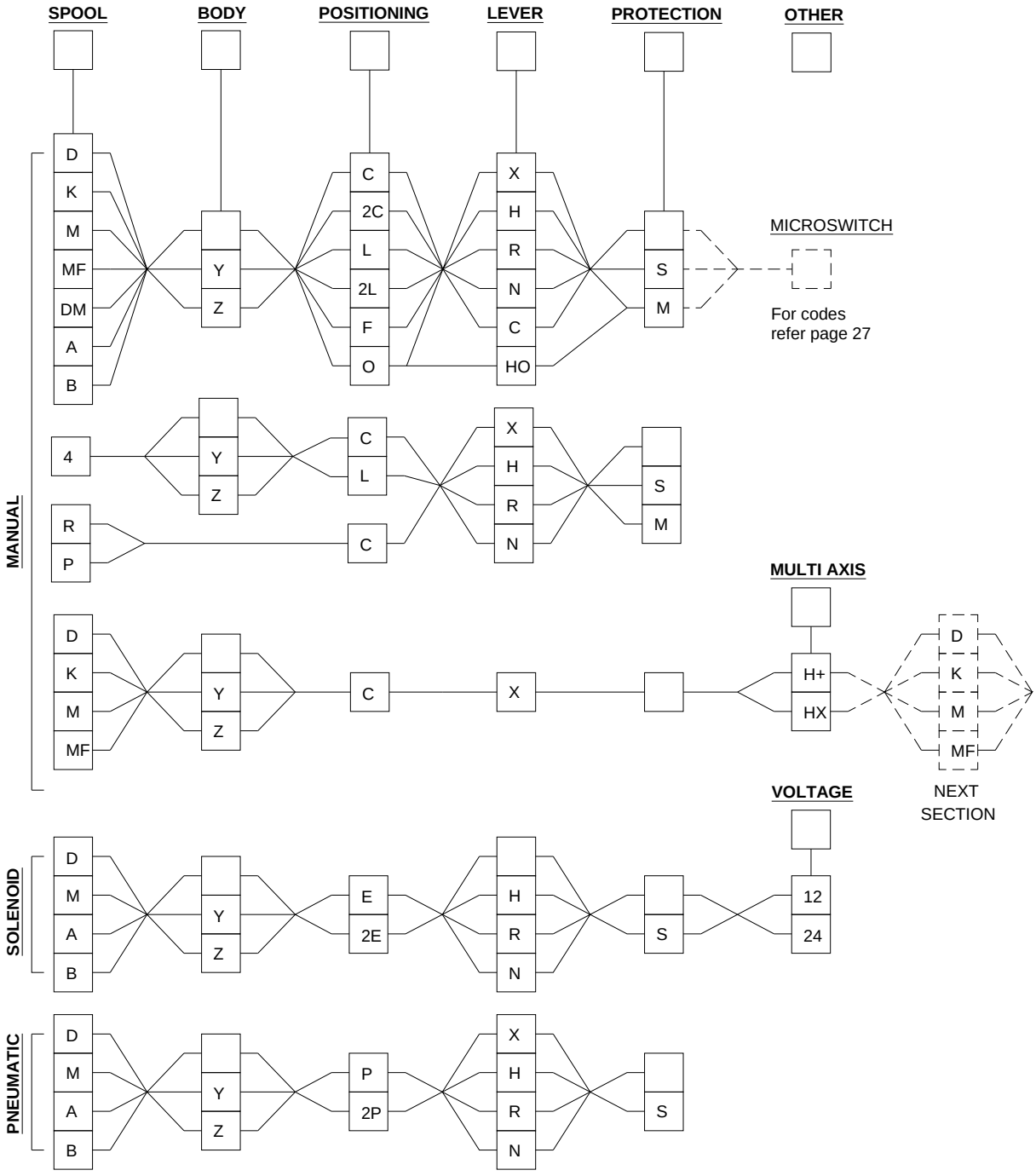


Hy-Pro
motion and control solutions

V4-40 & V5-60 WORKING SECTIONS

ORDER CODES

Create the order code by reading left to right, following the paths between options.
A selection of typical codes are shown on the next page.



V4-40 & V5-60 WORKING SECTIONS

ORDER CODES - EXAMPLES

A selection of typical spool section order codes generated by the matrix shown on the previous page. Manual, solenoid and pneumatic spool sections can be used in the same valve assembly.

MANUAL

SPOOL	BODY	POSITIONING	LEVER	PROTECTION	OTHER	
D		C	H			Cylinder spool Standard ports Spring centred Standard lever
M		L	H	S		Motor spool Standard ports Detented Marinised lever
K		L	H	M		Fine metering cylinder spool Standard ports Detented Marinised lever and spool
M	Z	C	R	S		Motor spool Interface for service line relief manifold Spring centred Reversed marinised lever
A		C	x			Single acting cylinder spool Standard ports Spring centred No lever

SOLENOID

SPOOL	BODY	POSITIONING	LEVER	PROTECTION	VOLTAGE	
D		E	H	S	12	Cylinder spool Standard ports Solenoid control Marinised lever 12VDC
M	Z	2E			24	Motor spool Interface for service line relief manifold 2 position solenoid control 24VDC
M	Y	E			24	Motor spool Manifod interface for pilot check valves Solenoid control 24VDC

PNEUMATIC

D		P	H			Cylinder spool Standard ports Pneumatic control Standard lever

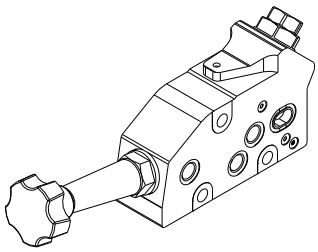
Hy-Pro
motion and control solutions

V4-40 & V5-60 INTERSECTIONS

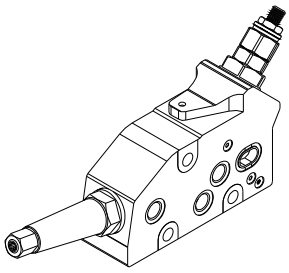
FLOW CONTROL SECTION - MANUAL

A fully pressure and flow-compensated metering type flow control, which can be included in V4 and V5 manual and solenoid valve assemblies. The regulated flow is supplied via the pressure gallery to down stream sections, while those up stream are unaffected. A variety of controls are available to allow the flow to be pre-set or continually adjustable. A relief valve option limits the maximum pressure within the pressure gallery and a series link version can be supplied to ensure full pump flow is available to the regulated sections even when up-stream sections are in use.

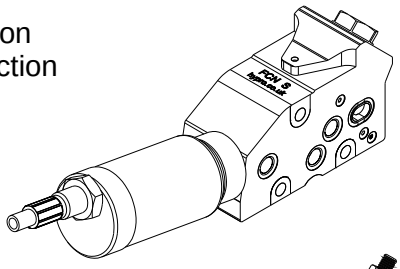
Handwheel adjustment



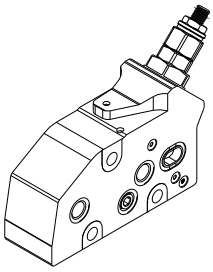
Screw adjustment with Relief valve



Cable operation
Series connection



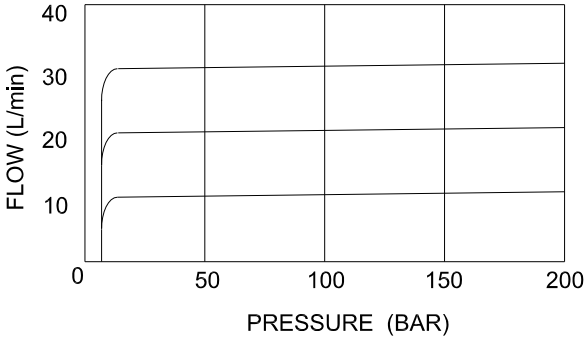
Fixed flow
With relief valve



Adjustable range	0-60 L/min
∆P Inlet to outlet 40 L/min	0.6 bar
ΔP Inlet to service 40 L/min	4.6 bar

Relief Valve
Adjustable. Pilot Operated

Body	Aluminium
Weight	2.0kg
Width	38.1mm
	50.8mm (Series

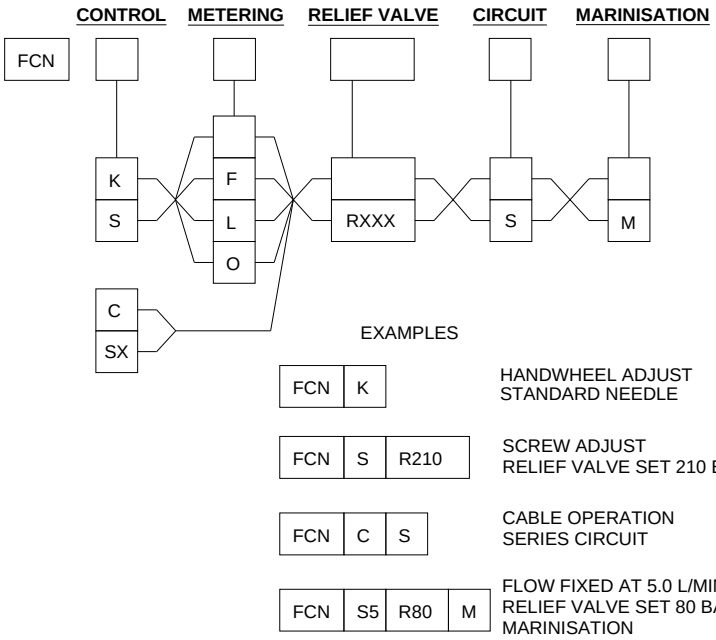


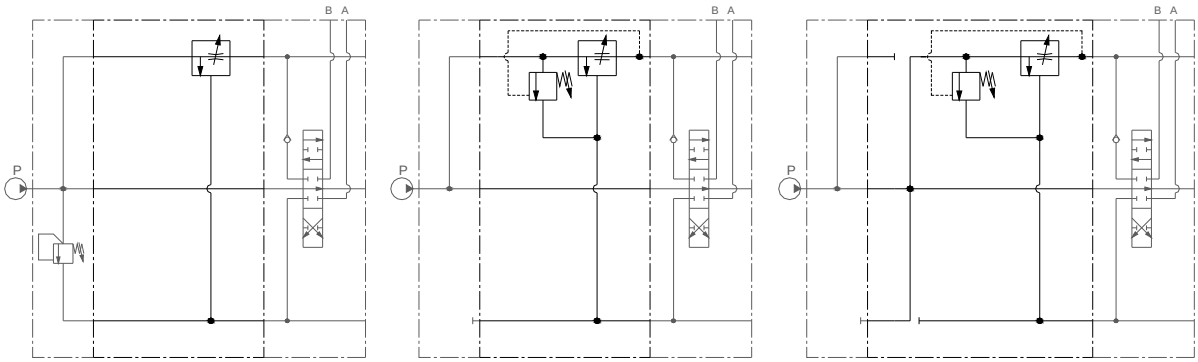
Hy-Pro
motion and control solutions

V4-40 & V5-60 INTERSECTIONS

Option	Code
Handwheel	K
Screw & lock nut	S
Cable	C
Fixed Flow	SX
Standard metering	-
Fine metering	F
1 Turn metering	L
No shut off metering	O
Marinisation	M
Relief valve	RXXX
Series connection	S

'X' = flow setting L/min
'XXX' = relief valve setting in bar.





Standard

Relief valve

Relief valve
& Series link

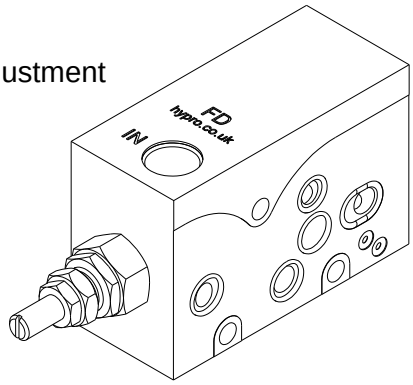
Hy-Pro
motion and control solutions

V4-40 & V5-60 INTERSECTIONS

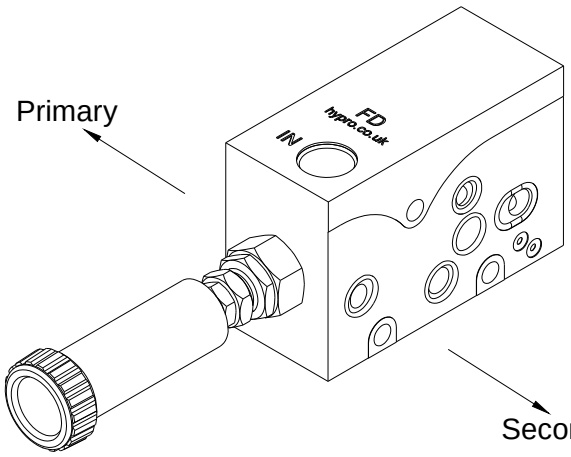
FLOW DIVIDER SECTION - MANUAL

The flow divider inter-section allows two hydraulic circuits to be built into one valve assembly. Flow is fed directly to the section. The adjustable priority flow is fed to the left hand sections and the remaining flow to the right hand sections, thus allowing two circuits to be run simultaneously and independently. A series link can be incorporated in the flow divider section, re-combining the flow and feeding the full flow to the right hand sections, whilst maintaining priority flow to the left hand sections.
The pressure compensated flow divider can be supplied with either a graduated handwheel for continous adjustment or preset with a lock nut.

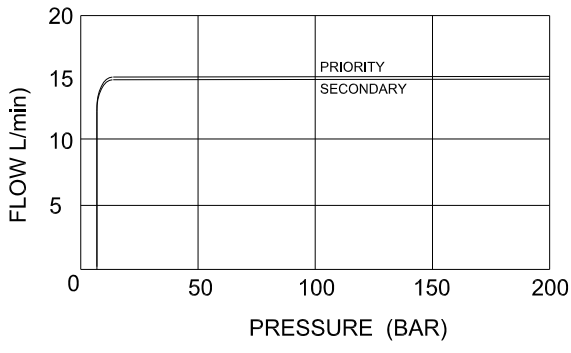
Screw adjustment



Handwheel adjustment



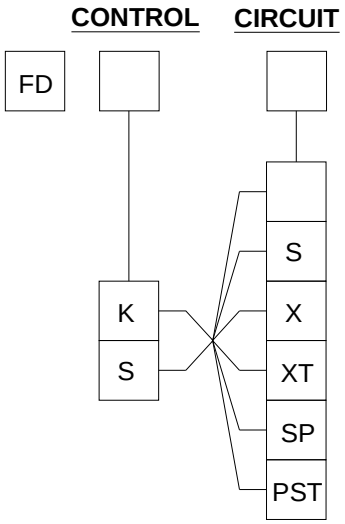
Input flow @ 60 L/min	
Priority flow maximum	36 L/minute
Priority flow minimum	0 L/minute
Secondary flow maximum	60 L/minute
Secondary flow minimum	24 L/minute
∆P inlet to service	6.9 bar
Body	Aluminium
Weight	0.9 Kg
Width	50mm

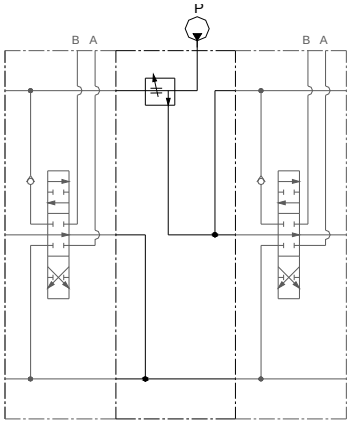


Hy-Pro
motion and control solutions

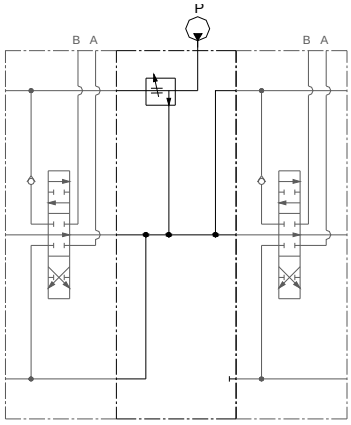
V4-40 & V5-60 INTERSECTIONS

Option	Code
Handwheel	K
Screw & lock nut	S
Parallel Connection	
Series Connection	S
Parallel - Priority to Tank Internal connection	X
Parallel - Priority Tank External Port	XT
Series - Priority Flow Available when no Upstream section Selected	SP
Parallel - Priority Flow to External Port	PST

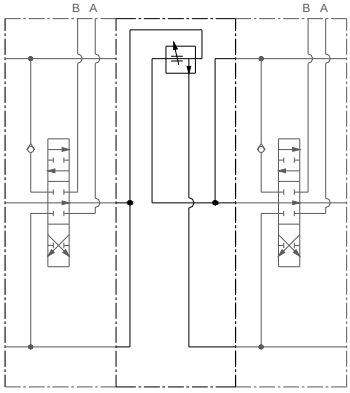




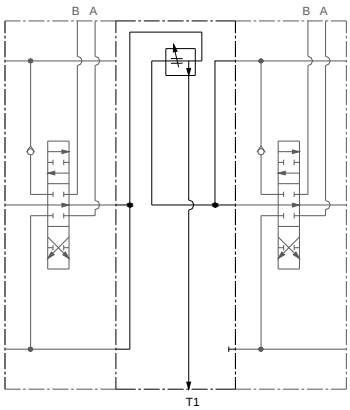
Parallel



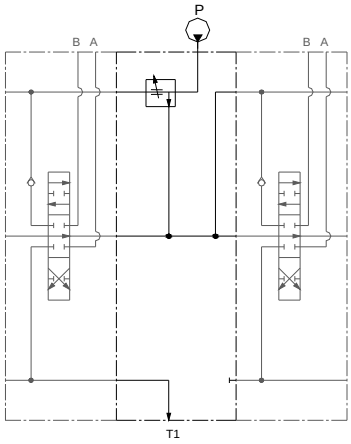
Series S



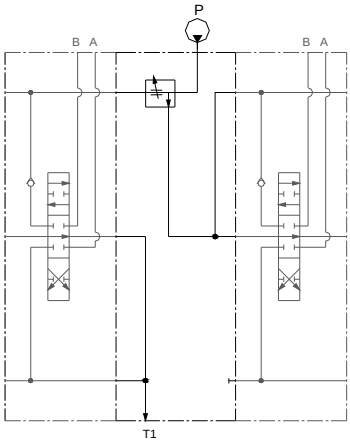
Parallel with Priority Flow to Tank X



Parallel with Priority Flow to Port XT



Series with Priority Tank port SP



Parallel with Priority Tank port PST

Hy-Pro
motion and control solutions

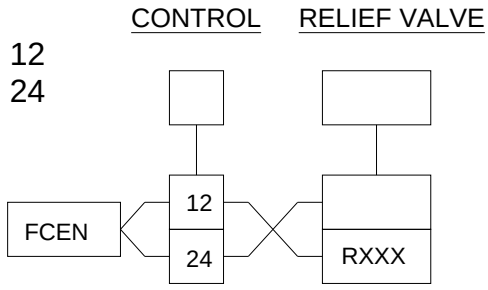
V4-40 & V5-60 INTERSECTIONS

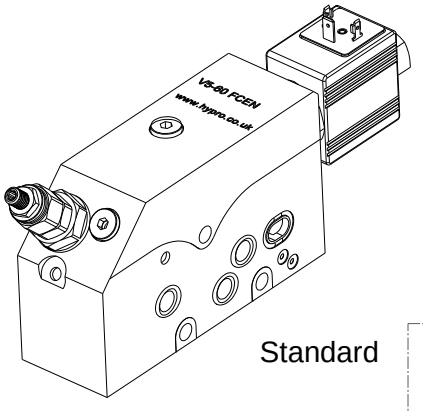
FLOW CONTROL SECTION - ELECTRIC

The priority type pressure compensated flow control varies the flow available to the down stream sections in the valve assembly. If used in conjunction with solenoid sections complete remote control can be achieved electronically.
When used in conjunction with a proportional PWM driver plug, the control is obtained with a 10k Ω potentiometer or 0 to 10V DC external signal.

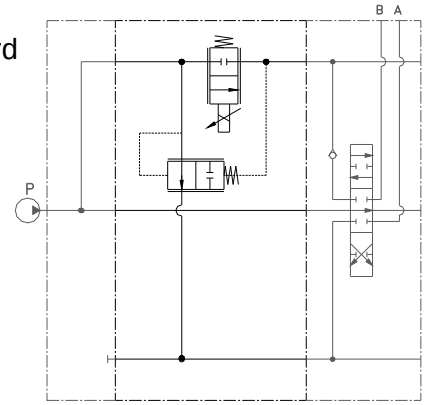
Option	Code
Proportional 12 VDC	12
Proportional 24 VDC	24
Relief valve	RXXX

'XXX' = relief valve setting inbar.





Standard

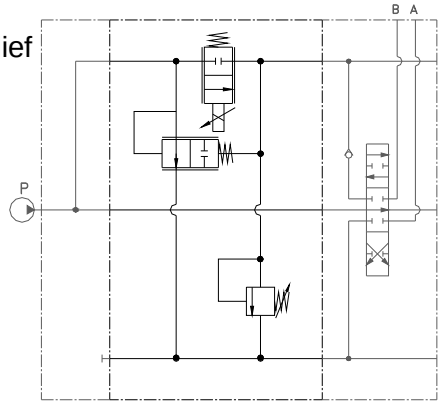


Adjustable range	0–60 L/min
∆p inlet to outlet 60L/min	0.9 bar
∆p inlet to service	6.9 bar
Maximum pressure	210 bar
Coil Power	28 Watts
Coil Max Current	3.4 Amps @ 20°C

Relief Valve
Adjustable.
Pilot Operated

Body	Aluminium
Weight	2.0kg
Width	51mm

With relief valve



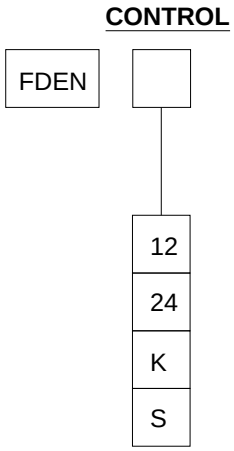
Hy-Pro
motion and control solutions

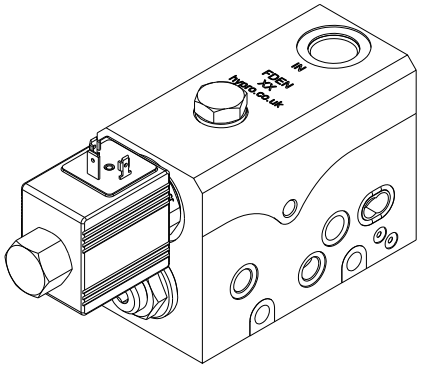
V4-40 & V5-60 INTERSECTIONS

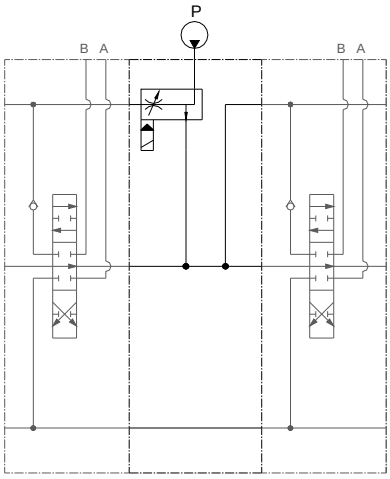
FLOW DIVIDER SECTION - ELECTRIC

The adjustable priority flow is unaffected by variable pump delivery or pressure changes in either priority or secondary circuits. Control is via a proportional driver plug and 10KΩ Potentiometer. A manually controlled version is also available.

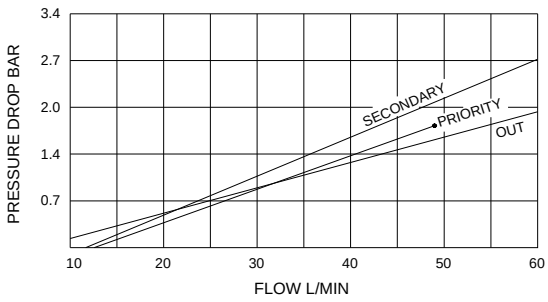
Option	Code
Proportional 12 VDC	12
Proportional 24 VDC	24
Manual handwheel	K
Manual Screw Adjuster	S







Priority flow	0-60 L/min
Secondary flow	0-60 L/min
ΔP inlet to tank 40 lpm	2.0 bar
ΔP inlet to priority service 40 L/min	1.6 bar
ΔP inlet to secondary service 40 L/min	2.0 bar
Maximum pressure	210 bar
Coil Power	28 Watts
Coil Max Current	3.4 Amps @ 20°C
Body	Aluminium
Weight	1.5 Kg
Width	70mm



Hy-Pro
motion and control solutions

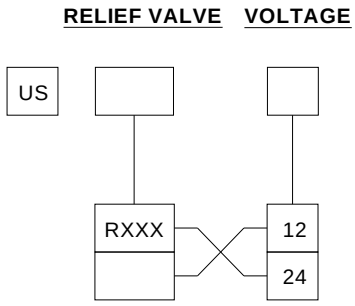
V4-40 & V5-60 INTERSECTIONS

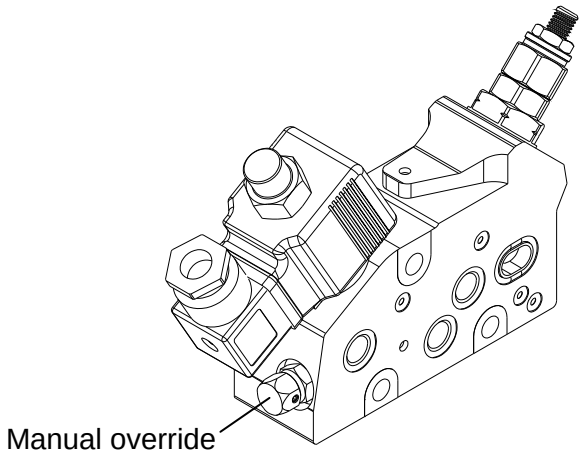
SOLENOID UNLOADER SECTION

Designed to rapidly unload the pressure gallery to tank when power to the coil is interrupted. Can be used in both manual and solenoid operated valve assemblies to override the other controls of the valve bank.

Option	Code
Relief valve	RXXX
12VDC	12
24VDC	24

'XXX' = relief valve setting in bar.



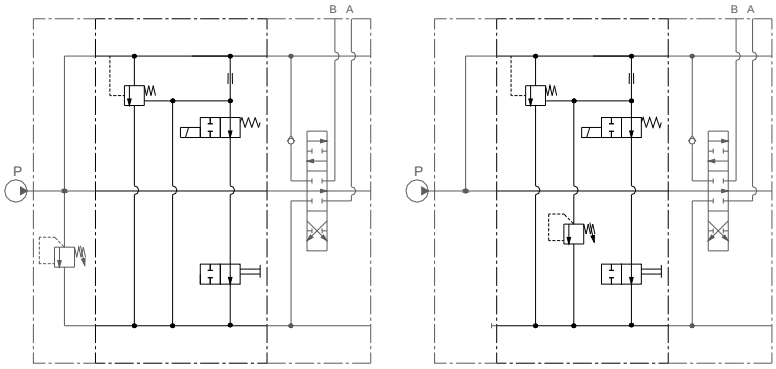


Relief Valve
Adjustable.
Pilot Operated

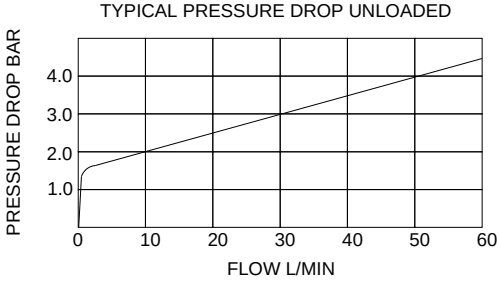
Manual Override
Screw in to operate

Unloader
NC Normally closed
Unloads P to T
unless energised

Material Aluminium
Weight 1.7kg
Width 38.1mm



STANDARD RELIEF VALVE



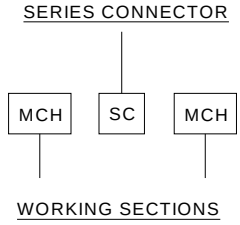
Hy-Pro
motion and control solutions

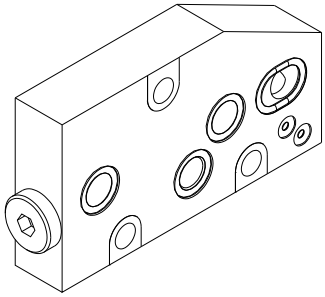
V4-40 & V5-60 INTERSECTIONS

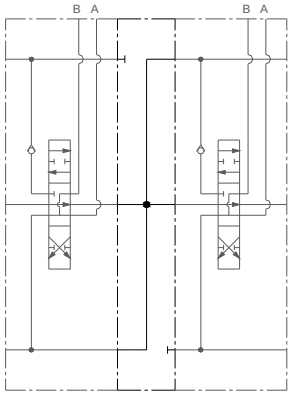
SERIES CONNECTOR SECTION

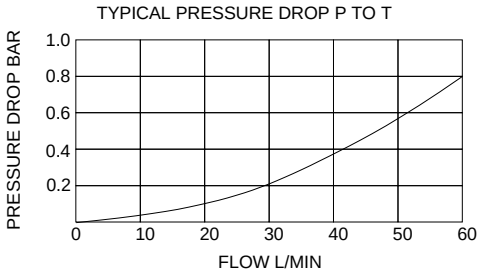
Series connector sections are designed to be fitted between two working sections, connecting in series the actuators that they control. Series connectors can be used to synchronize two hydraulic motors where the return oil from one is fed to the inlet of the second.

The series connector effects only the valve sections immediately upstream and downstream of its position in the valve bank. Other sections remain connected in parallel. When using the series connectors, consideration must be given to upstream sections. This is because the normally open tank gallery in the valve bank is pressurized when the series connected actuators are on load. If this is a problem specially designed inlet covers are available which contain a separate outlet port for the relief valve bypass flow. Special provision has also to be made for ancillary valves when used with series-connected valve banks. In such cases, customers are advised to discuss their circuit design with Hy-Pro.









Material	Aluminium
Weight	0.3kg
Width	19.0mm

Hy-Pro
motion and control solutions

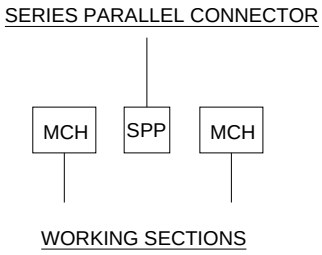
V4-40 & V5-60 INTERSECTIONS

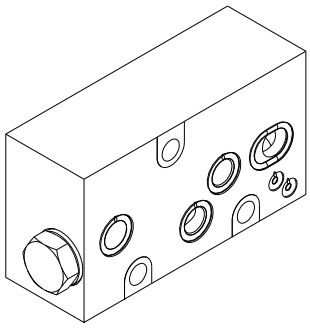
SERIES PARALLEL SECTION

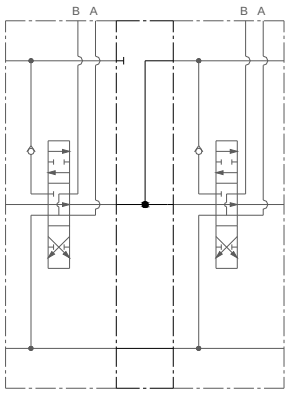
The series parallel section is used to give priority to up stream sections.

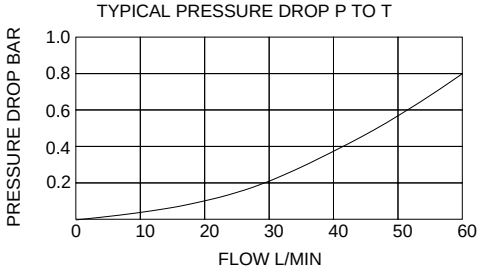
The pressure gallery is isolated from down stream sections when the up stream section is selected. If the up stream section is single acting, the pressure gallery is only closed when in the raised position, i.e. the down stream sections will have a pressure feed when in the lower position.

The series parallel connector can be used in manual and solenoid valve assemblies to provide an interlock or ensure a service is activated in the correct sequence.









Body	Aluminium
Weight	0.5 kg
Width	38.1mm

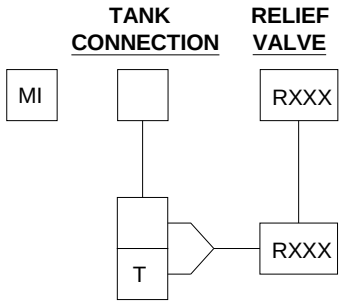
Hy-Pro
motion and control solutions

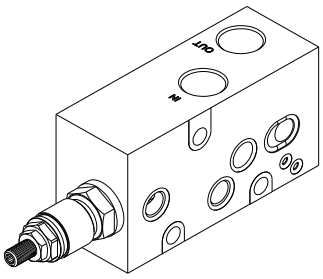
V4-40 & V5-60 INTERSECTIONS

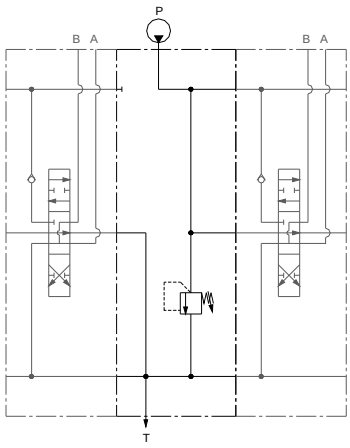
MID INLET SECTION

A mid inlet section is used to enable two separate control valves to be built into one assembly. The first valve is fed from the inlet cover whilst the second is fed by the mid-inlet intersection. An adjustable relief valve is included to protect the pump supplying the sections fed by the mid-inlet. The mid inlet section combines elements of our standard inlet and outlet covers thus permitting a very compact installation with less hoses and connections than two separate valve banks. Options are available to have the outlet flow from both sides of the assembly combined into one outlet (MI) or as 2 separate outlets if the combined return flow is greater than 60 lpm (MIT).

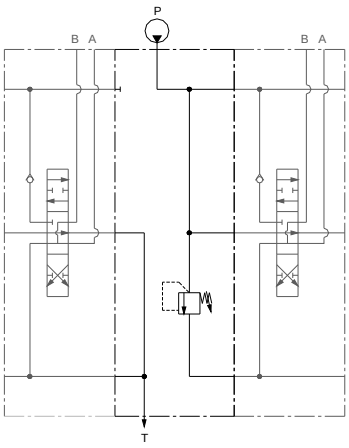
Option	**Code**
Internal tank connection	-
External tank connection	T
Relief Valve	RXXX







MI RXXX



MI T RXXX

∆p at rated flow P to T	0.5 bar
Body	Aluminium
Weight	0.6 kg
Width	38.1mm

Hy-Pro
motion and control solutions

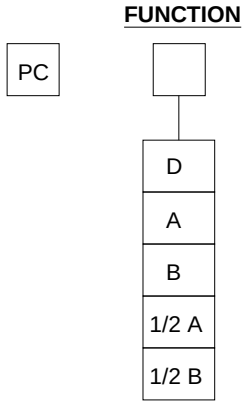
PILOT OPERATED CHECK VALVE

The check valves are mounted on the service port face of a 'Y' type spool section. Where a single acting check valve is used, the section must be fitted with an 'M' spool to ensure pilot pressure is available to unlock the check valve.

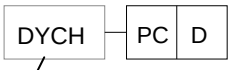
When used with cylinders, whose rod is large in relation to the diameter of the bore, it is possible for pressures to be generated in the rod end which can not be unloaded. To avoid this the ratio of the cylinder full area to the rod annular area must not be greater that 4:1, which is the pilot ratio of this check valve.

When lowering a loaded cylinder, the pump may not maintain the pilot pressure. This can result in jerky operation caused by oscillation of the pilot piston. This can be overcome by restricting the flow out of the cylinder to maintain pilot pressure at the check valve.

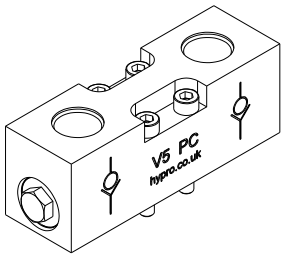
Option	Code
Double Acting	D
Single Acting 'A' Port	A
Single Acting 'B' Port	B
Double Acting 'A' Port Only	1/2 A
Double Acting 'B' Port Only	1/2 B

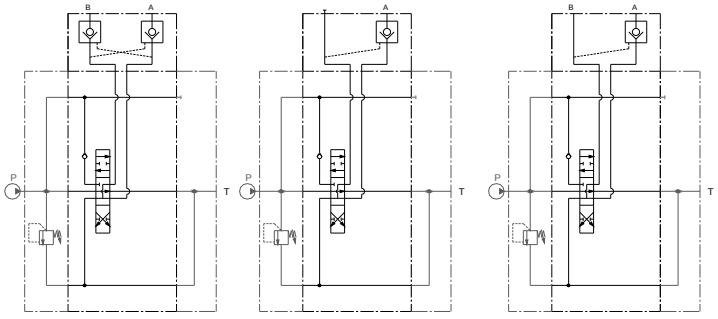


Example code



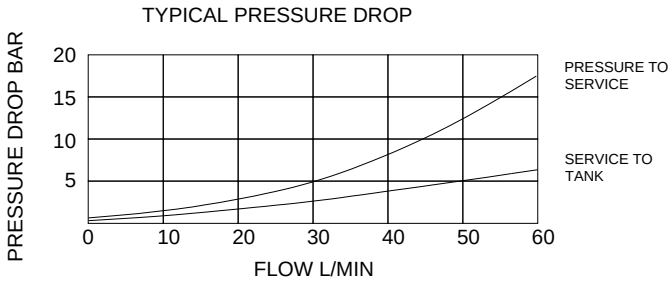
Working section with 'Y' type interface





Double Acting | Single Acting | 1/2 Double Acting

Opening pressure	3.0 bar
Leakage @210 bar	0 cc/min
Ratio	4:1
Body	Cast iron
Mounting interface	Y
Ports V4-40	G3/8
Ports V5-60	G1/2
Weight	1.2kg



Hy-Pro
motion and control solutions

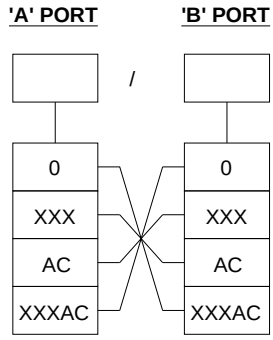
SERVICE LINE RELIEF & ANTI-CAVITATION VALVE

The service line relief valve is used to limit the pressure in individual service lines and provide anti-cavitation protection in circuits with overrun situations to maintain oil in the actuators.

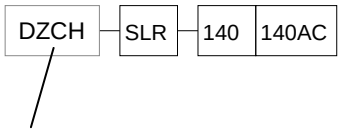
The valve is mounted onto the service port face of a "Z" type valve section using four cap screws. The body has a cavity for each service line. This will accept one of four cartridges, relief, anti-cavitation, relief and anti-cavitation or a blanking cartridge.
Relief valves are pre-set but are fully adjustable retrospectively using the socket screw located under the cap nut.
The service line relief and anti-cavitation valves can be used on manual and solenoid operated sections.

Option	Code
No Function	0
Service Line Relief	XXX
Anti-Cavitiation	AC
Service Line Relief & Anti-Cavitiation	XXXAC

XXX = Relief valve setting in Bar

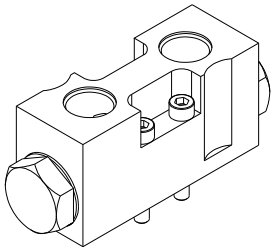


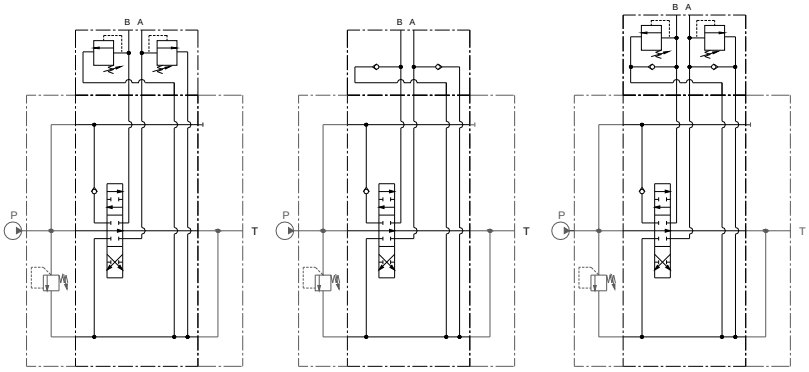
Example code



140 Bar A port
140 Bar & AC B port

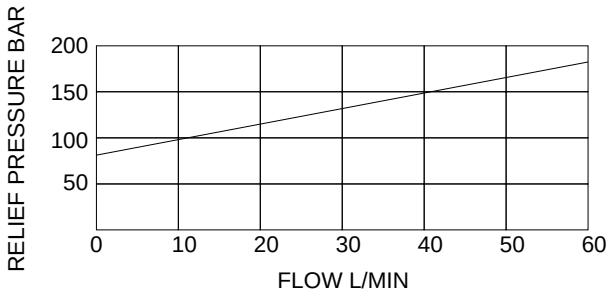
Working section with 'Z' type interface





XXX/XXX AC/AC XXXAC/XXXAC

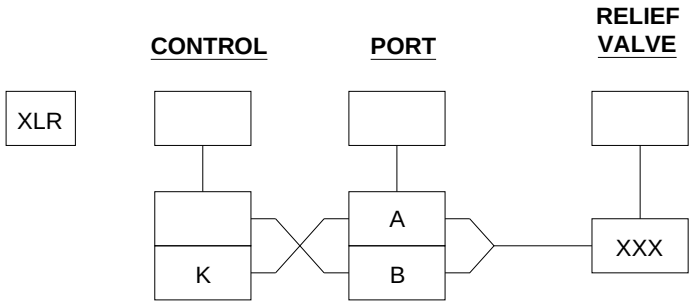
Relief valve range	20 bar to 205 bar
Adjustment (approx)	35 bar per turn
Anti-cavitation	0.5 bar
Mounting interface	Z type
Body	Aluminium
Ports V4-40	G3/8
Ports V5-60	G1/2
Weight	0.5 kg



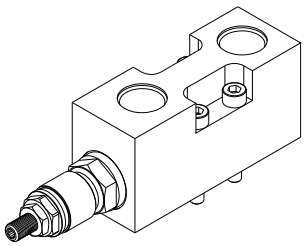
Hy-Pro
motion and control solutions

CROSS-LINE RELIEF VALVE

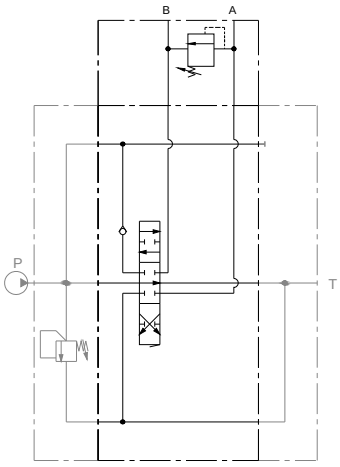
Option	Code
Screw & Locknut	-
Handwheel	K
Acting on A port	A
Acting on B port	B



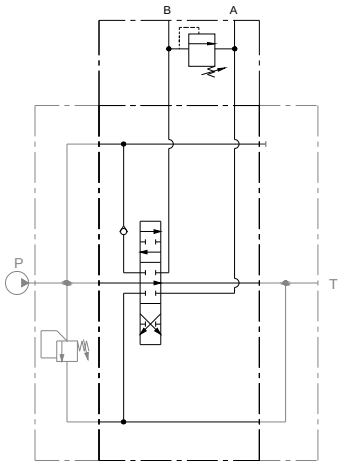
'XXX' = SETTING IN BAR



The cross line relief valve relieves pressure in the service port and unloads it into the tank port. It is uni-directional but the manifold can be rotated so that the relief valve acts upon either the A service port or B service port. Note that on solenoid sections B port relief only is possible. Adjustment is made by either screw and locknut or by a handwheel



XLR A XXX



XLR B XXX

Relief Valve Range	20 bar to 250 bar
Adjustment	35 bar per turn
Mounting interface	Y Type
Body	Aluminium
Ports V4-40	G3/8
Ports V5-60	G1/2
Weight	0.5 kg
Width	N/a

Hy-Pro
motion and control solutions

SOLENOID 4 POSITION VALVE

The solenoid 4 position valve connects both sides of a double acting cylinder to tank allowing it to float. For example when used with a D spool solenoid section on grass cutting or snow ploughing equipment the blades will follow the contours of the ground when the solenoid is actuated.

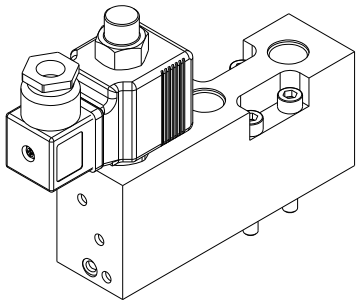
VOLTAGE

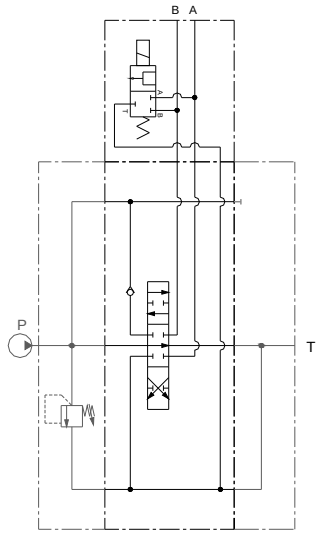
4	12
	12
	24

Example code

DZEH 12	4	12

Working section with
'Z' type interface



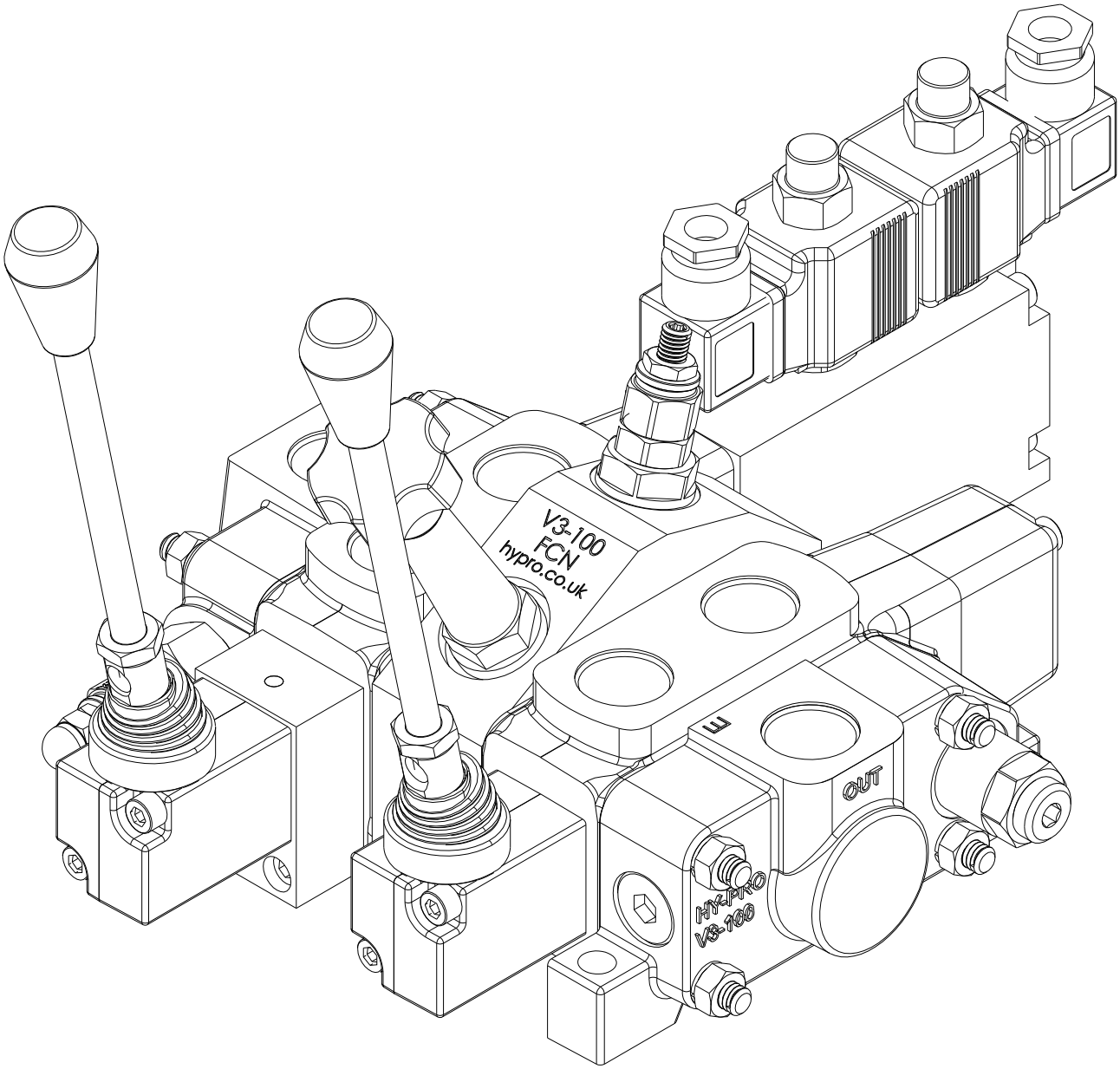


Coil Power	24 Watt
Connector	IP67
Mounting interface	Z Type
Ports	G3/8
Body	Aluminium
Weight	1.0kg
Width	N/a

Hy-Pro
motion and control solutions

Hy-Pro
motion and control solutions

V3-100 LPM DIRECTIONAL CONTROL VALVE



Hy-Pro
motion and control solutions

V3-100 LPM DIRECTIONAL CONTROL VALVE

DESCRIPTION

The V3-100 directional sectional spool valve is one of the most compact 100 l/min valve available. Designed for pressures up to 250 bar the valve is available with two, three and four position spool control options and a range of spool types. The lever mechanism is a pressure die casting which totally encloses the spool for added protection. A range of optional ancillary valves are also available to be able to match the requirements of the most complicated and demanding circuits.

The V3-100 is also available with solenoid control. It uses 12V and 24V 24 Watt DC coils to switch the internal oil pilot to engage the main spool. A damping orifice fitted in the pilot line eliminates the harshness usually associated with standard direct acting solenoid valves and gives a positive feel to the control system.

Both manual and solenoid sections can be built into a valve assembly and the solenoid sections have the options of lever override.

Application

Designed to be used in applications requiring a rugged, compact control valve with the option of remote control. Typically in the automotive recovery, recycling and agricultural industries where a mix of manual and solenoid control is essential.

Features

- Excellent metering characteristics.
- Excellent load holding.
- Integral load check valve.
- Open and closed centre option.
- Adjustable, pilot operated relief valve.
- Robust enclosed lever mechanism.
- Flow control option.
- 100% production testing.
- Environmental protection option.
- 12 and 24V DC 24 Watt coils.
- Soft spool action.
- Interchangeable with manual sections.
- Lever override option.

V3-100 OPERATING CONDITIONS

Maximum pressure 250 bar
210 bar*
Maximum back pressure 25 bar

* Assemblies with solenoids
Rated flow 100 l/min

Spool leakage 210 bar 20ºc
Standard Spools <6cc/min
4 Position Spools <8cc/min

Materials
Cast Iron BS1452-250
Aluminium BS1490
Spools Case Harden BS6507
Tie studs BS970/191 817M40T

Tie stud torque 13.5Nm

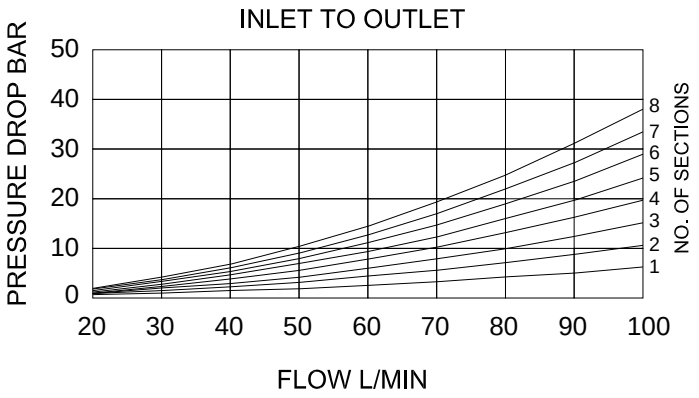
External protection
Black Paint to HTS1006

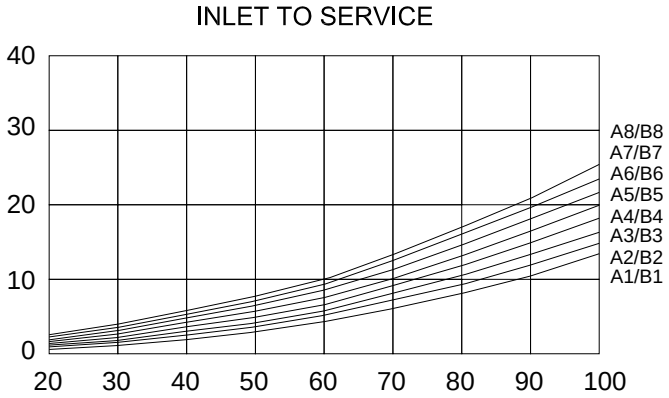
Stainless steel
BS 10088-3
Steel
Zinc chromate BS 1706 Zn3
Nitrotech NQ3
Black paint HTS1006

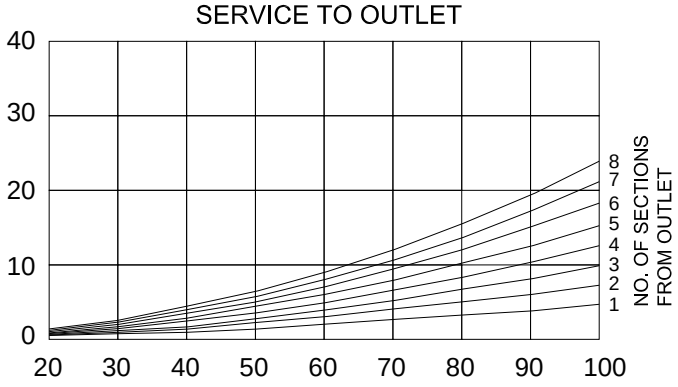
Static Seals	Nitrile
Reciprocating	Viton
Spool High Pressure	PTFE
Anti Extrusion	PTFE

Electrical

Coil Voltage	12 or 24VDC
Max cont. Voltage	12V = 13.8V
	24V = 27.5V
Coil Power	24W
Protection	IP67
Connection	DIN 43650
Cable Ø	6 - 8mm
(not supplied)	

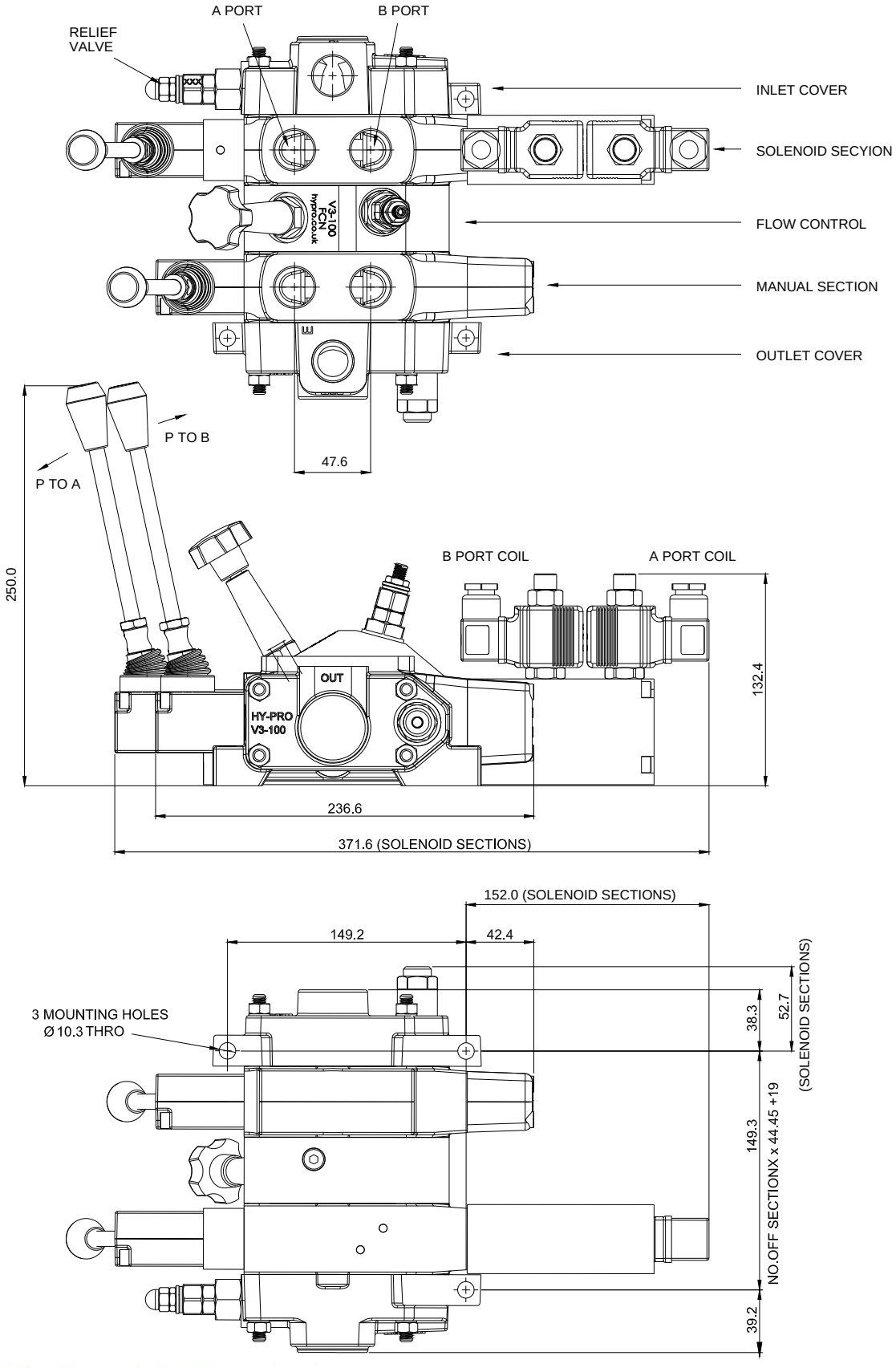






Hy-Pro
motion and control solutions

V3-100 INSTALLATION DETAILS



Hy-Pro
motion and control solutions

V3-100 CONTENTS

Hy-Pro

motion and control solutions

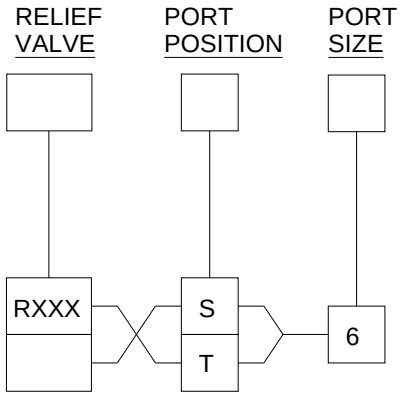
V3-100 INLET COVERS

STANDARD INLET

The inlet covers come with G(BSP) ports in either top or side positions.
They can be fitted with or without a relief valve.

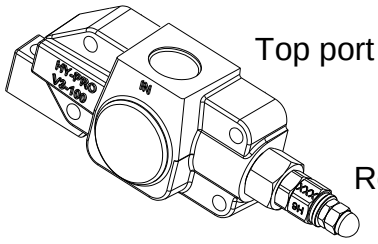
Option	Code
Relief valve	RXXX
Side port	S
Top port	T
Port size G3/4	6

'XXX' = relief valve setting in bar.



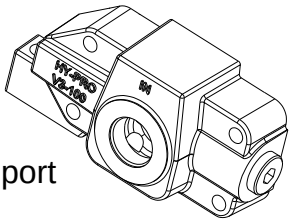
Example codes

	T	6	Inlet with Top G3/4 port
	S	6	Inlet with Side G3/4 port
RXXX	T	6	Inlet with Top G3/4 port and Relief valve
RXXX	S	6	Inlet with Side G3/4 port and Relief valve

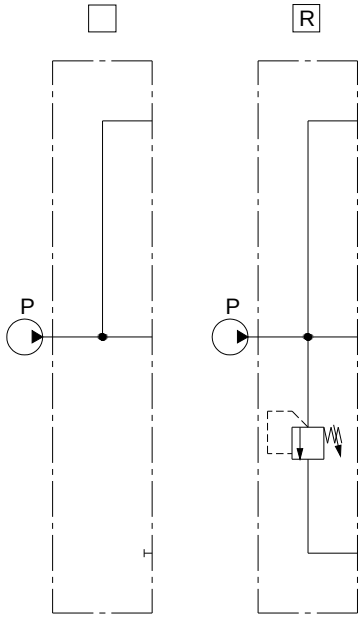


Top port

Relief Valve



Side port



No Relief Valve Relief Valve

Relief Valve
Adjustable. Pilot Operated

Mounting 1 x Ø10.3 Through Holes
Material Cast Iron
Weight 0.75kg
Width N/a

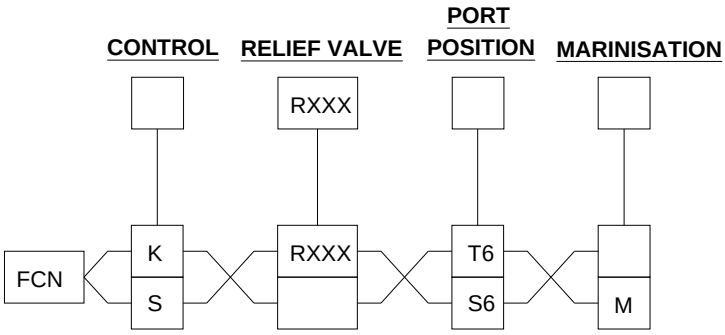
Hy-Pro
motion and control solutions

V3-100 INLET COVERS

INLET WITH FLOW CONTROL

Option	Code
Handwheel	K
Screw & lock nut	S
Relief valve	RXXX
Top port G3/4	T6
Side port G3/4	S6
Marinisation	M

'XXX' = relief valve setting in

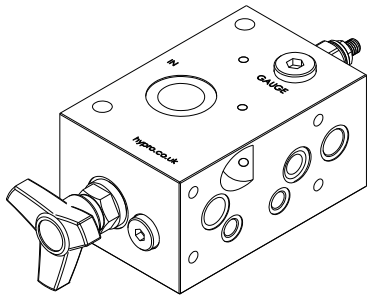


Example codes

FCN	K	R210	T6
FCN	S		S6

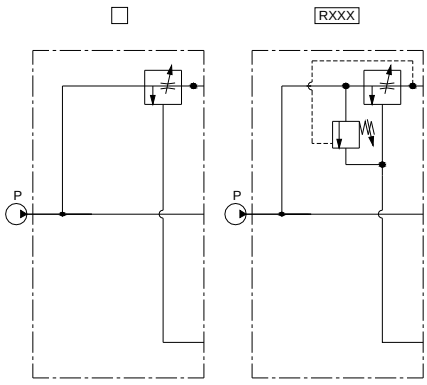
Handwheel, relief valve set 210 Bar, Top G3/4 port

Screw adjuster, no relief valve, SideG3/4 port



Pressure & flow compensated

Adjustable range	0-100 L/min
∆P Inlet to outlet 40 L/min	0.6 bar
Inlet to service 40 L/min	4.6 bar
Max Pressure	210 bar



Relief Valve
Adjustable. Pilot Operated

Mounting	2 x Ø10.3 Through Holes
Body	Aluminium
Weight	2.0kg

Hy-Pro
motion and control solutions

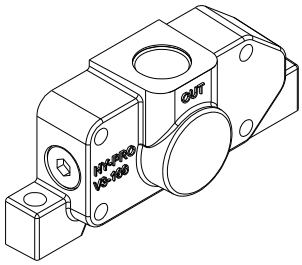
V3-100 OUTLET COVERS

STANDARD OUTLETS

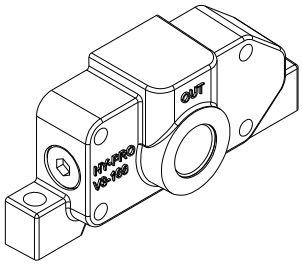
The outlet covers come with G(BSP) ports in either top or side positions. Pressure carry over is available by selection of an alternative outlet cover.

If a solenoid spool section is used in the assembly an 'E' type outlet is used which contains the pilot pressurising valve and the additional drillings for the pilot connections.

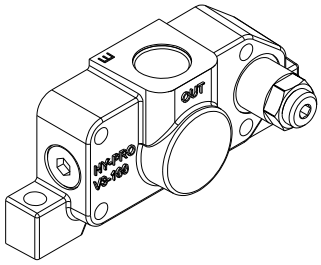
Top port



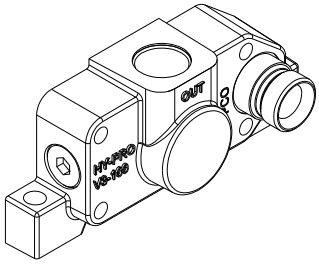
Side port



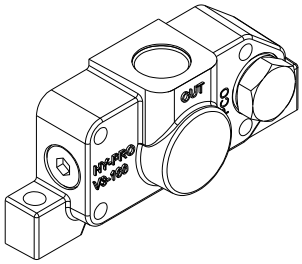
Solenoid



Pressure Carry



Closed Centre

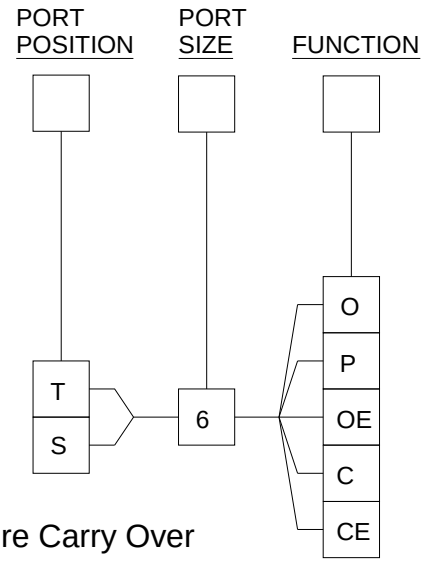


Body	Cast Iron
Weight	1.7kg

Hy-Pro
motion and control solutions

V3-100 OUTLET COVERS

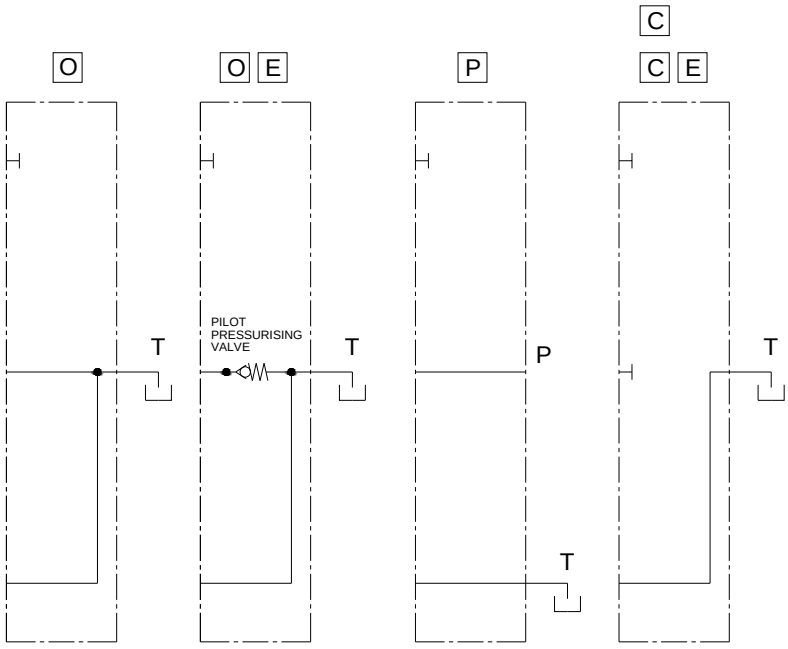
Option	Code
Top port	T
Side port	S
G3/4 port	6
Outlet	O
Outlet - solenoid	OE
Pressure Carry Over	P
Closed Centre - Solenoid	CE



Example codes

T	6	O	Outlet with G3/4 Top port
S	6	P	Outlet with G3/4 Side port and Pressure Carry Over
T	6	OE	Outlet with G1/2 Top port for Solenoid sections
T	6	CE	Outlet with G1/2 Top port, Closed centre for Solenoid sections

Pilot connections omitted for clarity



Outlet

Outlet for solenoid sections

Outlet with PCO

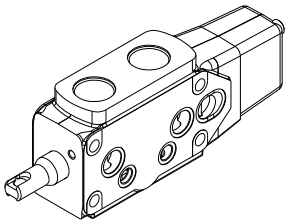
Outlet Closed centre manual and solenoid sections

Hy-Pro
motion and control solutions

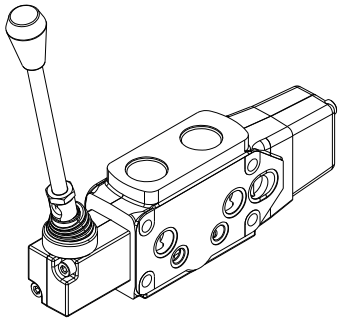
V3-100 WORKING SECTIONS

DESCRIPTION

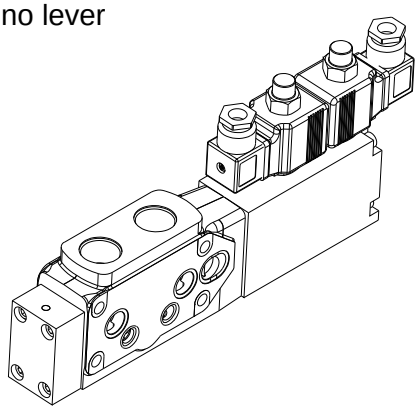
The V3-100 working sections spools to suit most applications. There are positioning options for 2, 3 and 4 position detent / spring centring mechanism combinations. Actuation options are manual levers – standard, rotary, cable, direct link to the spool, or pilot solenoid (with or without manual lever override).
The standard manual lever assembly has four orientation options and is universal across the range. Lever knobs are available in a variety of colours.



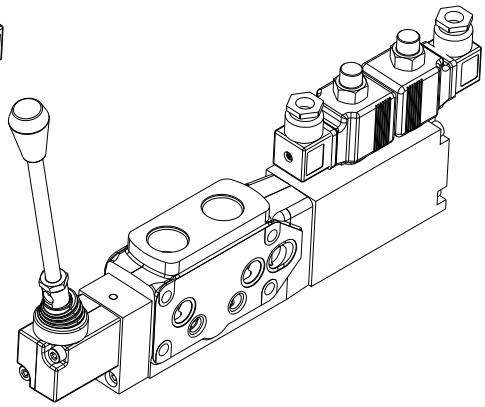
Manual
no lever



Manual
With Lever



Solenoid



Solenoid with
Lever Override

Weight	3.0kg Manual 4.9kg Solenoid
Width	44.5mm

Hy-Pro
motion and control solutions

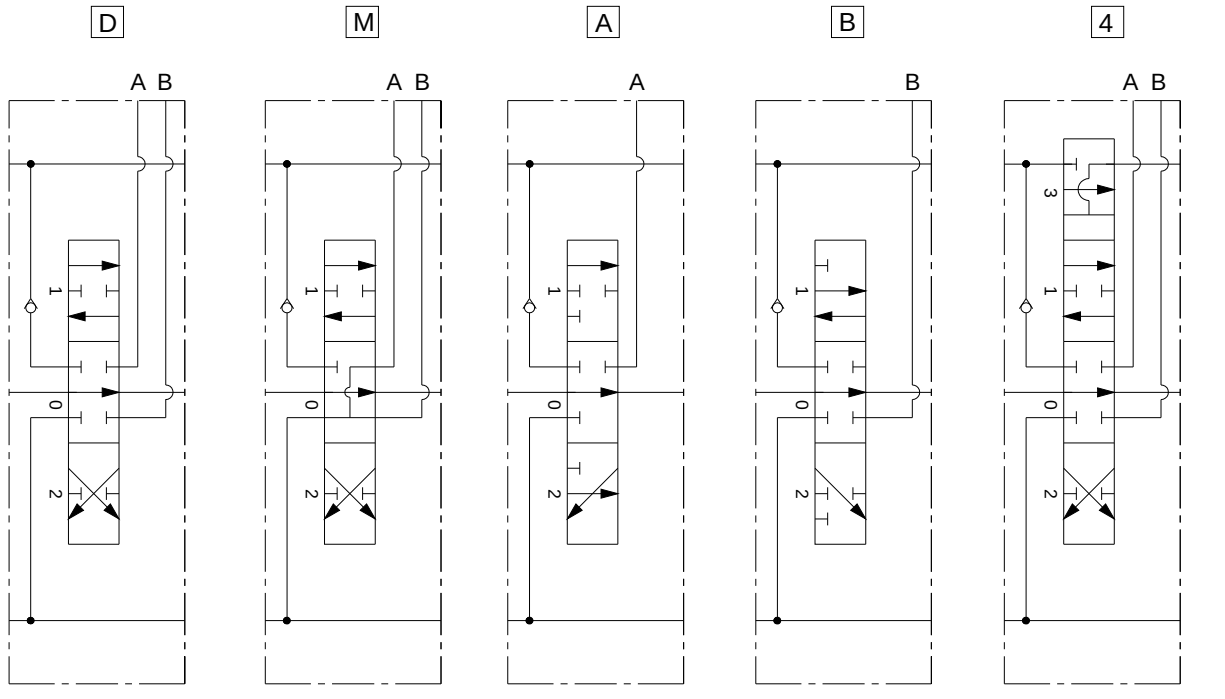
V3-100 WORKING SECTIONS

SPOOL OPTIONS

There are spools to suit most applications, all with excellent metering characteristics.

Manual	Code	Solenoid	Code
Cylinder	D	Cylinder	D
Motor	M	Motor	M
Single acting A port	A	Single acting A port	A
Single acting B port	B		
4 Position float	4		

Solenoid pilot connections
Omitted for clarity.



CYLINDER | MOTOR | SINGLE ACTING 'A' PORT | SINGLE ACTING 'B' PORT | 4 POSITION (FLOAT)

Hy-Pro
motion and control solutions

V3-100 WORKING SECTIONS

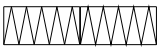
SPOOL POSITIONING MECHANISMS

2, 3 and 4 position control mechanisms in a combination of spring return and detent location.

Manual	**Code**
Spring - 3 Position	C
Spring - 2 position	2C
Detent - 3 Position	L
Detent - 2 position	2L
Detent friction - 3 Position	O
Spring / Detent - 3 Position	F
Float - 4 Position	4C
Solenoid	
Solenoid - 3 Position	E
Solenoid - 2 position	2E

Spring - 3 Position

C

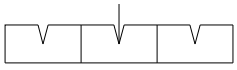


Spring - 2 Position

2C

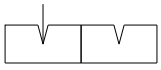
Detent - 3 Position

L



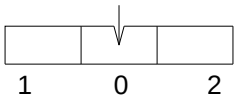
Detent - 2 Position

2L



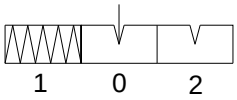
Detent Friction - 3 Position

O



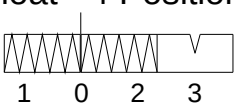
Spring / Detent - 3 Position

F



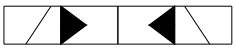
Float - 4 Position

C



Solenoid - 3 Position

E



Solenoid - 2 Position

2E

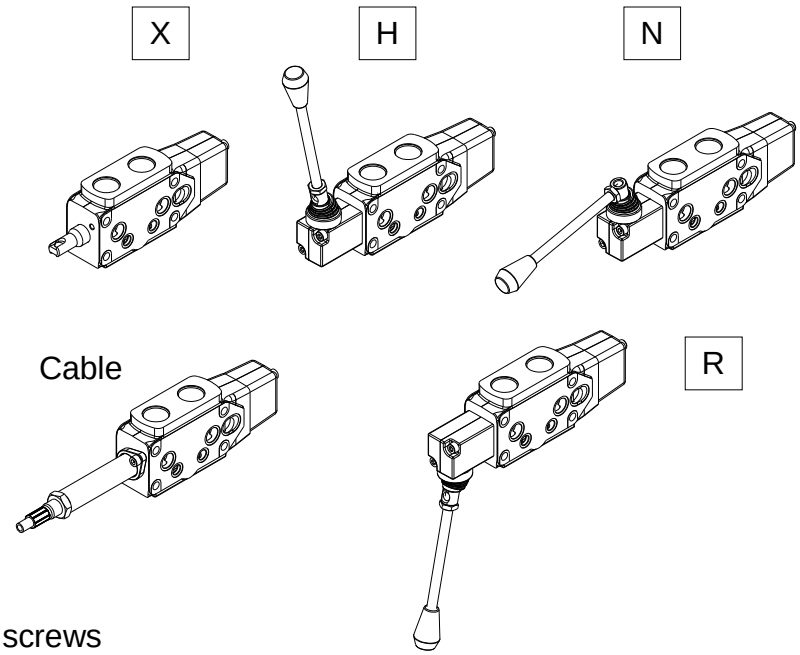
V3-100 WORKING SECTIONS

CONTROL OPTIONS

The standard lever is common across the sectional valve range. It can be supplied with environmental protection.

Option	Code
No Lever*	X
No Lever - solenoid sections	-
Standard Lever	H
Standard Lever - 90º	N
Standard Lever - Reversed	R

* For cable operation select code X. The mounting holes for the lever accept a standard ‘Morse’ type cable.



Fixing	2x M6 Cap screws Torque - 13.5Nm
Knob	Black standard, Red, Blue, Green, Yellow or Ident’ type
Body	Aluminium LM24TF
Fasteners	Deltatone
Width	N/a

Hy-Pro
motion and control solutions

V3-100 WORKING SECTIONS

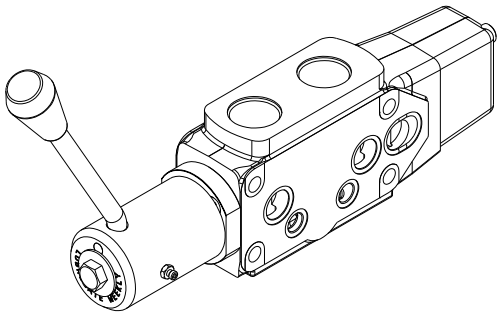
CONTROL OPTIONS - ROTARY LEVER

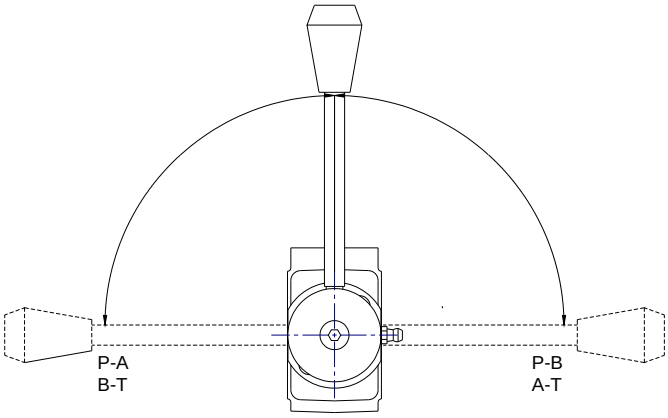
Used extensively in the forestry and fishing industry to control the speed of conveyors and winches. The Hy-Pro rotary lever has been developed specifically to enable the operator precise control of motors and cylinders. The lever rotates through a ± 90° arc and operates a scroll which converts the rotary action of the lever into axial movement of the spool.
The mechanism has a friction detent feature which positively holds the spool in neutral or will maintain the selected position when operated.
Because of the geometry of the lever it is not possible to include it in multi-section valves but it is a retro-fit to existing single section assemblies.

Refer to page 58 for full ordering code.

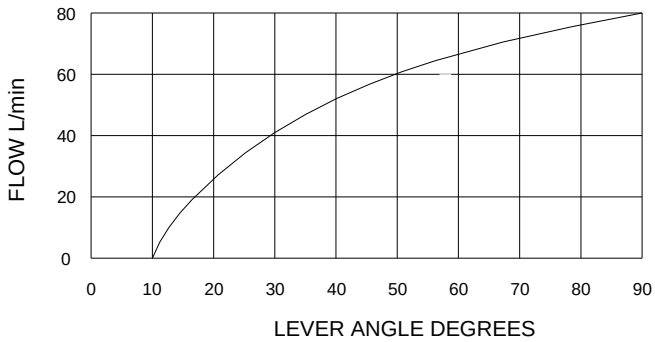
ROTARY LEVER

HO





TYPICAL METERING CHARACTERISTIC



Body	Manganese bronze CZ114
Lever	Stainless steel
Weight	2.0kg
Width	N/a

Hy-Pro
motion and control solutions

ENVIRONMENTAL PROTECTION OPTIONS

The valves are available with a marinised finish to withstand harsh environments. It comprises black anodised aluminium housings with stainless steel levers and locknuts. For further protection such as in marine applications the spool can be supplied with electro-less nickel plating.

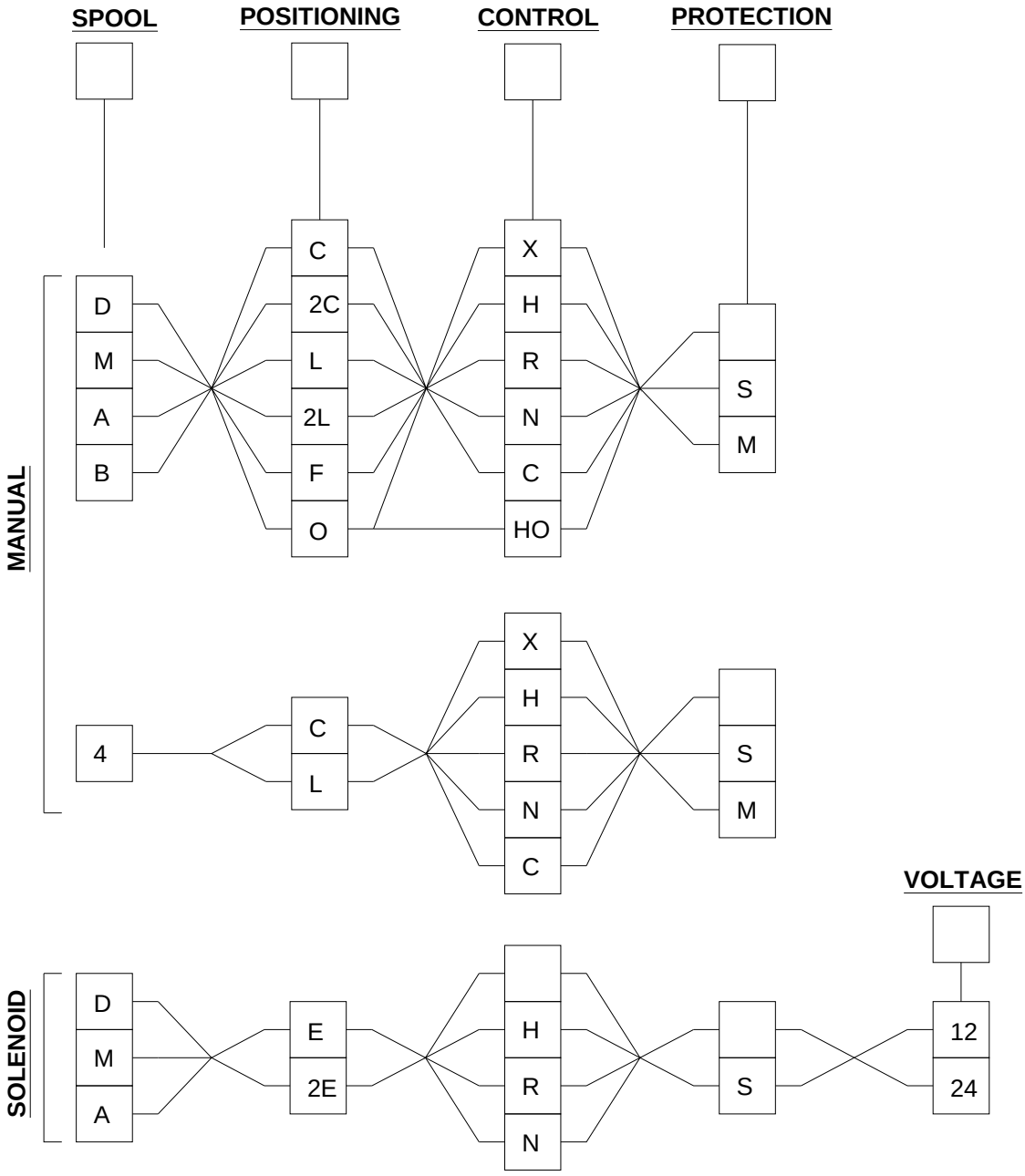
Refer to the order codes and examples on pages 58 and 59.

Option	Code
Standard	-
Stainless steel lever & Anodised housing	S
Stainless steel lever, Anodised housings & Nickel plated spool	M

V3-100 WORKING SECTIONS

ORDER CODES

Create the order code by reading left to right, following the paths between options.
A selection of typical codes are shown on the next page.



V3-100 WORKING SECTIONS

ORDER CODES - EXAMPLES

A selection of typical spool section order codes generated by the matrix shown on the previous page. Manual and solenoid spool sections can be used in the same valve assembly.

MANUAL

SPOOL	POSITIONING	CONTROL	PROTECTION	
D	C	H		Cylinder spool Spring centred Standard lever
M	2L	H	S	Motor spool 2 position detent Marinised lever
D	O	HO	M	Cylinder spool Rotary lever Marinised spool
M	C	R	S	Motor spool Spring centred Reversed marinised lever
A	C	X		Single acting cylinder spool Spring centred No lever

SOLENOID

SPOOL	POSITIONING	CONTROL	PROTECTION	VOLTAGE	
D	E	H	S	12	Cylinder spool 12V solenoid control with manual override Marinised lever
M	2E			24	Motor spool 2 position 24V solenoid control

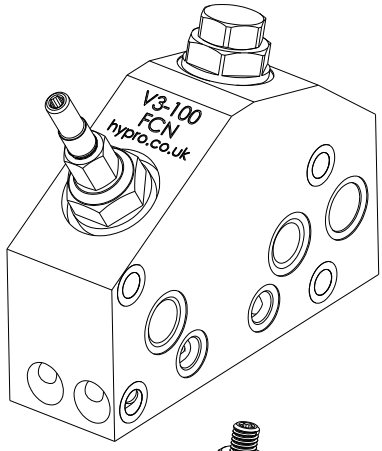
Hy-Pro
motion and control solutions

V3-100 INTERSECTIONS

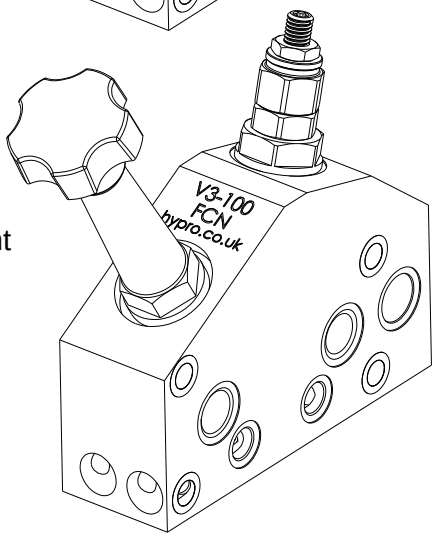
FLOW CONTROL SECTION - MANUAL

A pressure and flow compensated meter-in type flow control which can be included in V3-100 valve manual or solenoid assemblies. The regulated flow is supplied via the pressure gallery to 'down stream' sections, while 'up stream' are unaffected. The flow can be continuously adjusted using a handwheel or preset with a screw and lock nut. A relief valve can be fitted to protect the circuit. There are options for alternate metering and environmental protection.

Screw adjustment



Handwheel adjustment
With relief valve



Adjustable range	0-100 L/min
∆P Inlet to outlet 40 L/min	0.6 bar
ΔP Inlet to service 40 L/min	4.6 bar

Relief Valve
Adjustable. Pilot Operated

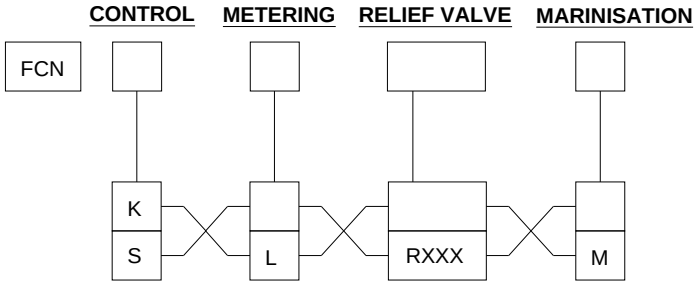
Body	Aluminium
Weight	2.5kg
Width	44.5mm

Hy-Pro
motion and control solutions

V3-100 INTERSECTIONS

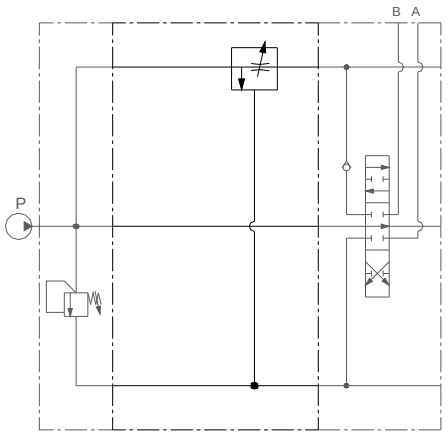
Option	Code
Handwheel	K
Screw & lock nut	S
Standard metering	
Fine metering	F
1 Turn 64 L/min metering	L
Marinisation	M
Relief valve	RXXX

'XXX' = relief valve setting in bar.

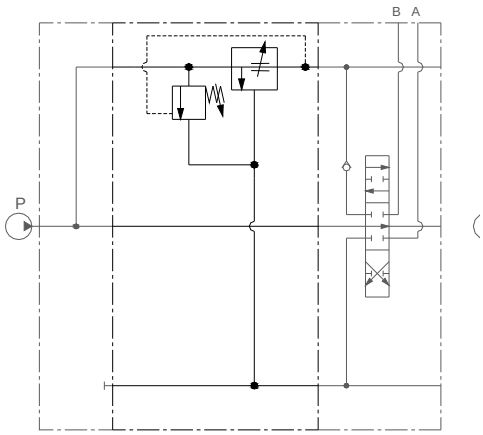


EXAMPLES

FCN	K		HANDWHEEL ADJUST STANDARD NEEDLE
FCN	S	R210	SCREW ADJUST RELIEF VALVE SET 210 BAR
FCN	K	M	HANDWHEEL ADJUST STANDARD NEEDLE MARINISED BODY



Standard



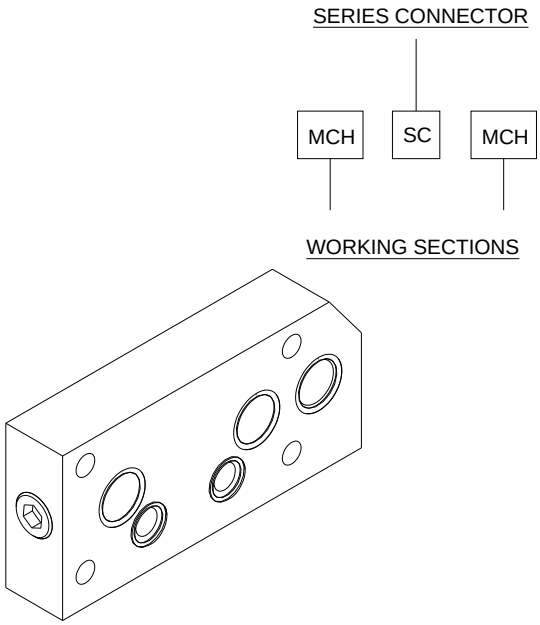
Relief valve

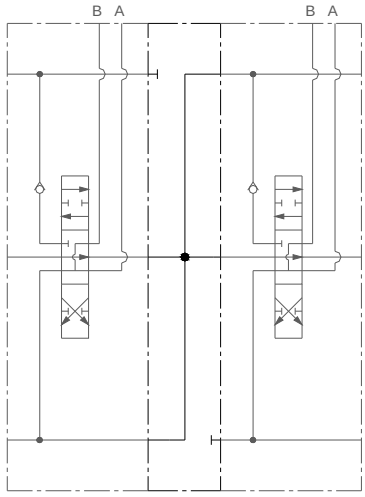
V3-100 INTERSECTIONS

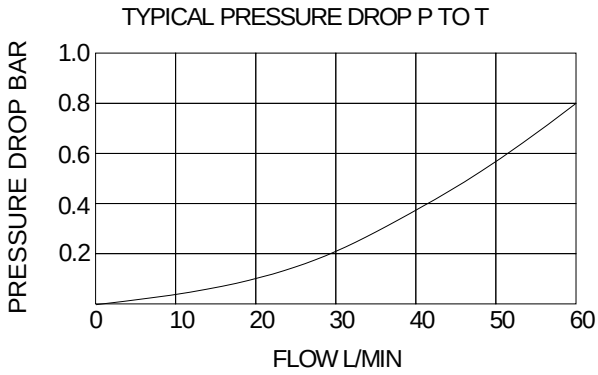
SERIES CONNECTOR SECTION

Hy-Pro series connectors are designed to be fitted between two valve sections, connecting in series the actuators that they control. Series connectors are often used to synchronize two hydraulic motors where the return oil from one is fed to the inlet of the second.

The series connector effects only the valve sections immediately upstream and downstream of its position in the valve bank. Other sections remain connected in parallel. When using the series connectors, consideration must be given to upstream sections. This is because the normally open tank gallery in the valve bank is pressurized when the series connected actuators are on load. If this is a problem specially designed inlet covers are available which contain a separate outlet port for the relief valve bypass flow.



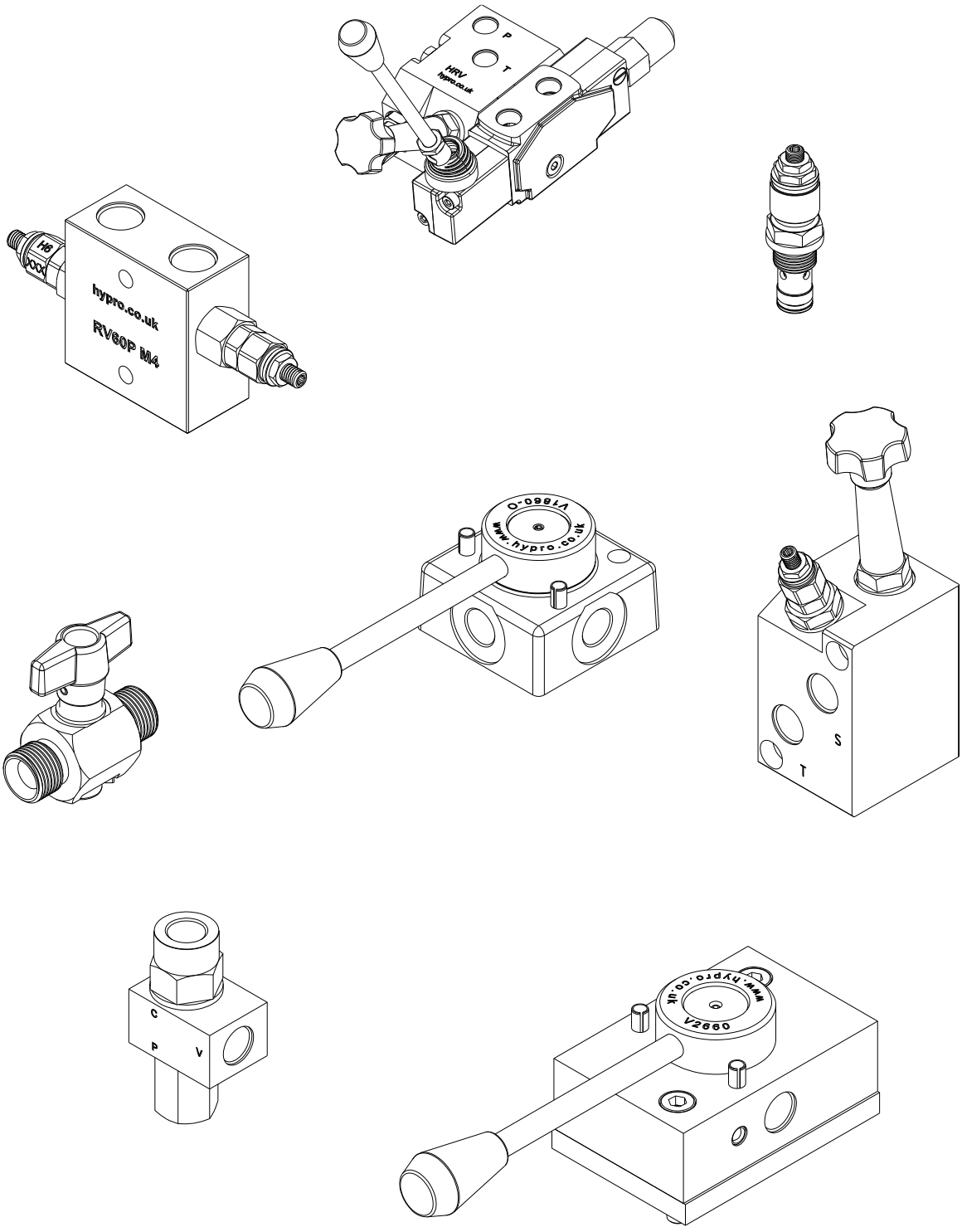




Body	Aluminium
Weight	0.5kg
Width	24mm

Hy-Pro
motion and control solutions

ANCILLARY VALVES

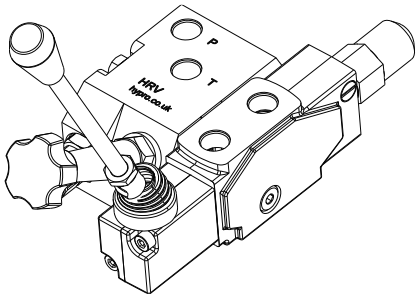


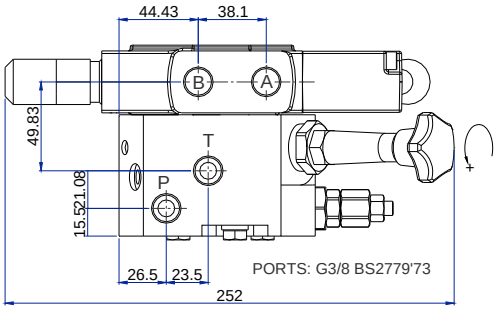
Hy-Pro
motion and control solutions

HRV HOSE-REEL VALVE

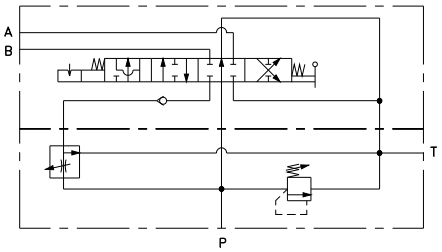
This compact valve has been specifically designed to operate hose and cable reels. It features a pressure compensated speed control with integral relief valve combined with a 4 positon spool valve.

The desired speed is selected using the handwheel then the direction of rotation is selected using the spring centred lever. The lever can also be detented into a fourth position which allows the reel to 'free wheel'. In the neutral position the reel is locked hydraulically.

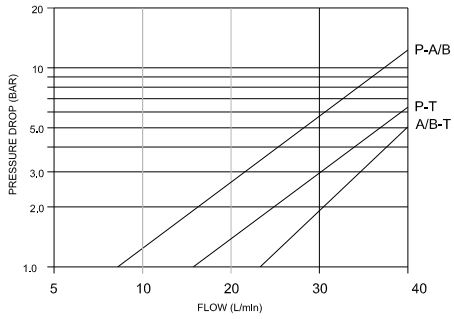


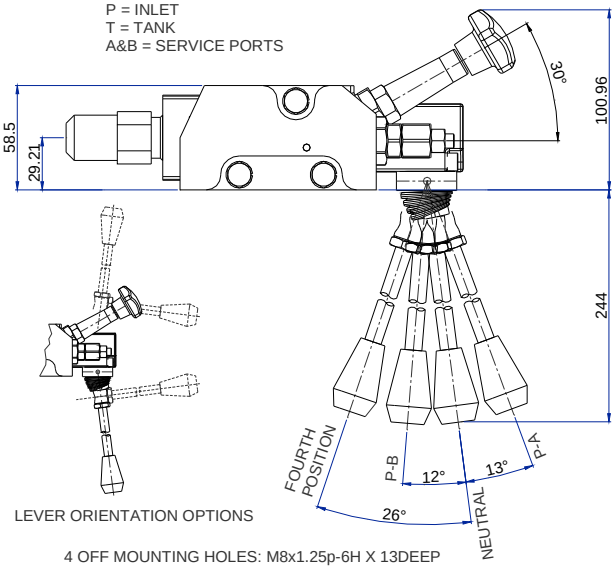


P = INLET
T = TANK
A&B = SERVICE PORTS



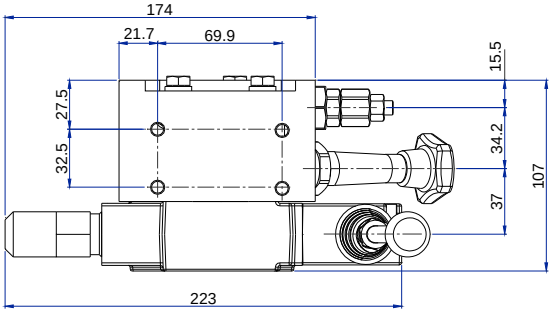
TYPICAL PRESSURE DROP





LEVER ORIENTATION OPTIONS

4 OFF MOUNTING HOLES: M8x1.25p-6H X 13DEEP



Rated flow	40 L/min
Flow control adjustment:	0-40 L/min
Relief valve adjustment:	7-250 bar
Relief valve range:	20-250 bar
Weight	3.3kg

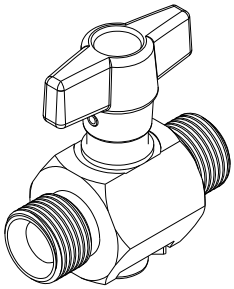
Hy-Pro
motion and control solutions

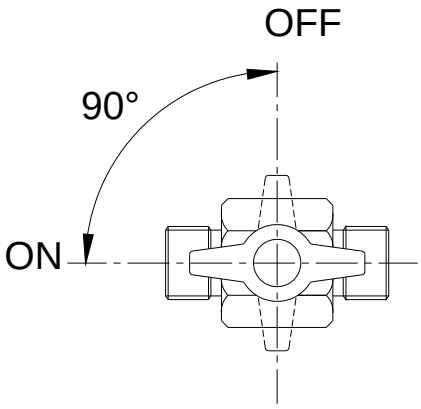
V1830 SHUT-OFF VALVE

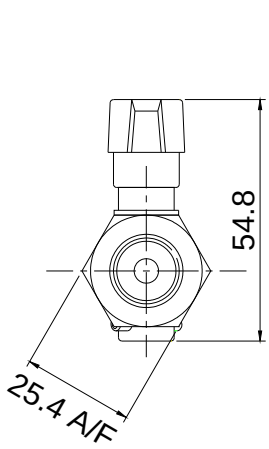
The V1830 is a two-way design with flow from A to B open in the on position and closed in the off.

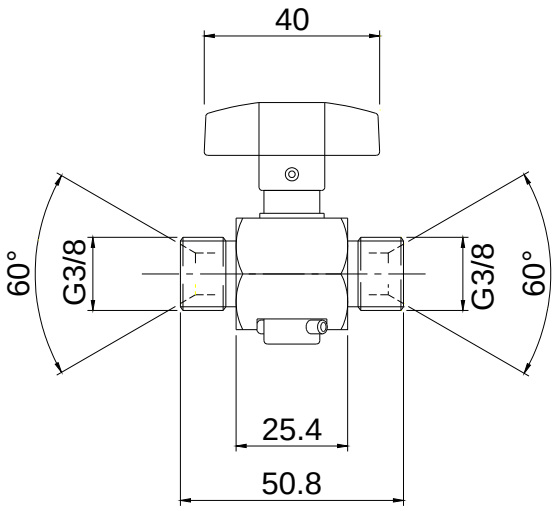
It features male threads with 60 degree sealing cones for connection to either rigid or flexible pipe-work.

Typically used to isolate components in a hydraulic circuit.

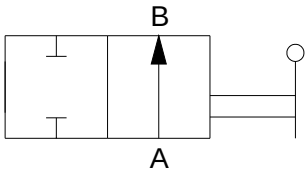








Ports	G3/8
Rated flow	27 l/min
Internal leakage @210 bar	<2cc/min



Materials

Body	Steel zinc plated
Knob	Thermoplastic
Spool	Hardened & ground

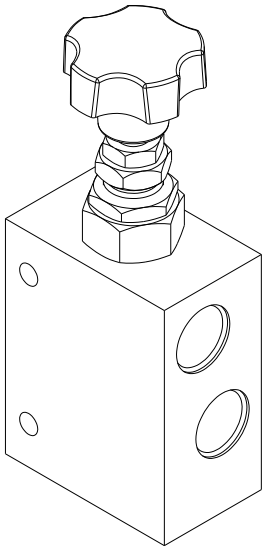
Weight 0.18kg

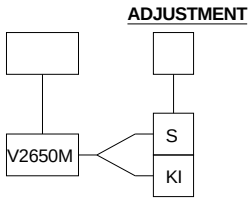
Hy-Pro
motion and control solutions

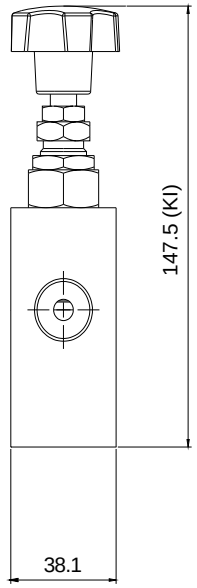
V2650M FLOW DIVIDER VALVE

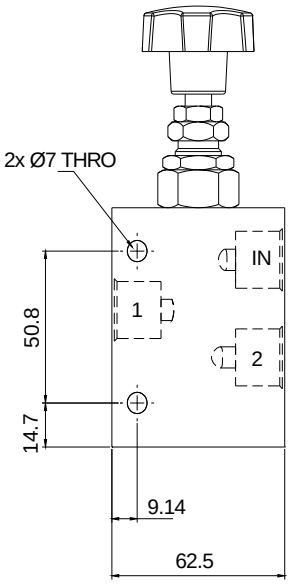
The Hy-Pro in-line flow divider valve allows independent control of two hydraulic circuits from one input. The flow is split into a controlled ‘Priority’ (1) flow to feed one circuit and ‘a secondary’ (2) flow to feed the other. The priority flow is unaffected by varying pump delivery or pressure changes in either circuit.

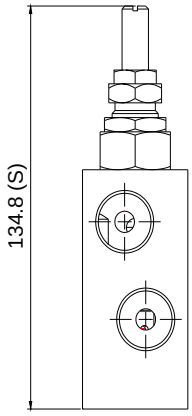
Control is either by handwheel (KI) or Screw and locknut (S).

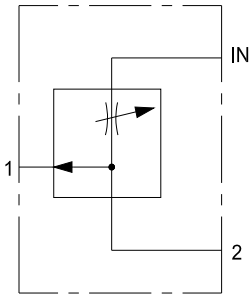








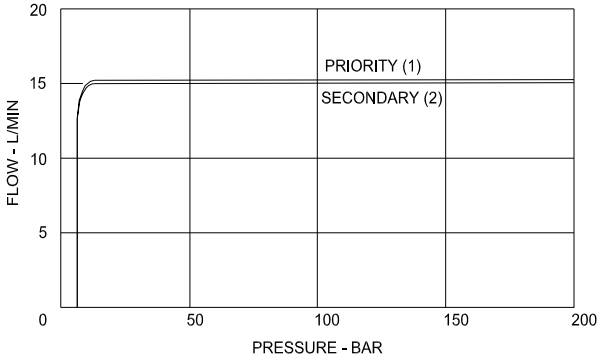




Performance

Rated flow	60 L/min
Priority flow maximum	36 L/min
Priority flow minimum	0 L/min
ΔP inlet to service	6.9 bar
Maximum pressure	250 bar
Ports	G1/2

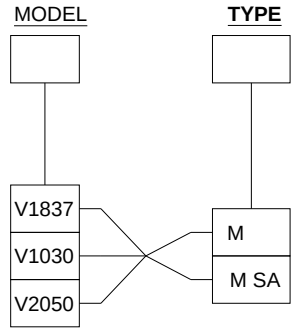
Weight 0.63 kgs

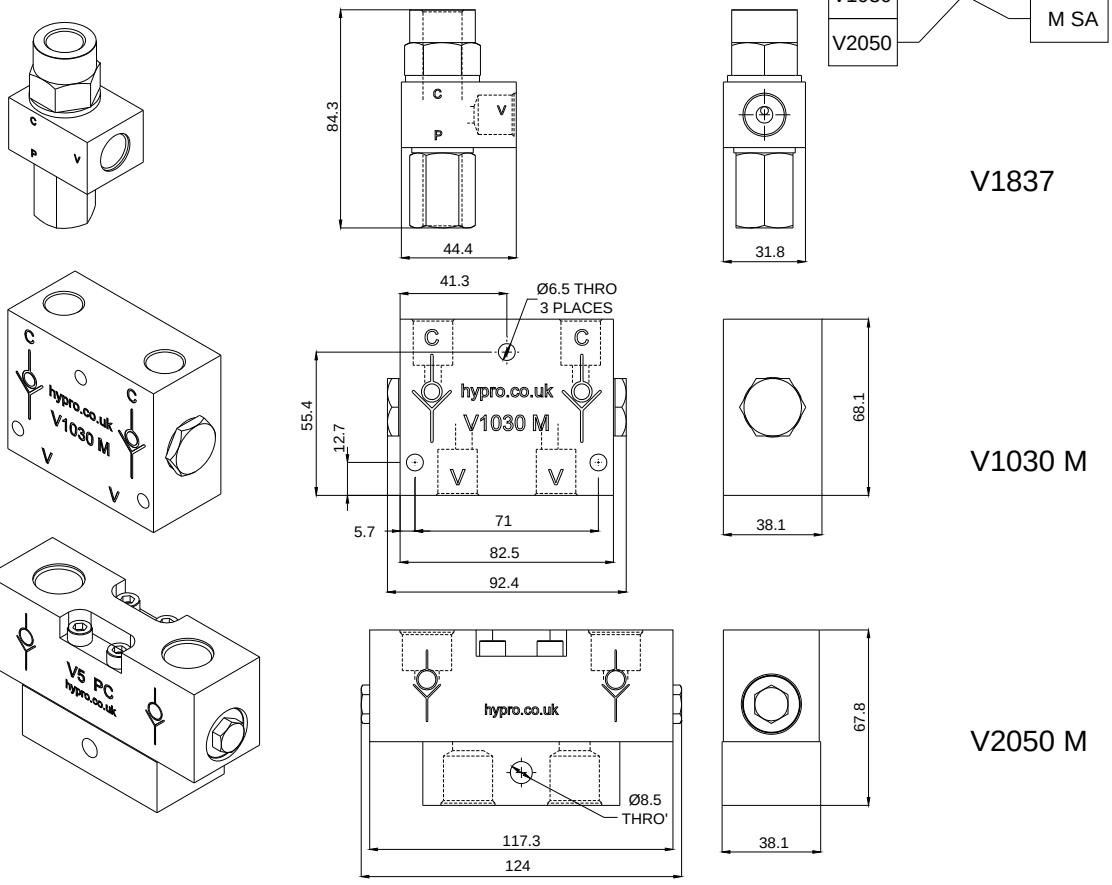


Hy-Pro
motion and control solutions

PILOT OPERATED CHECK VALVES

Option	Code
27 L/min	V1837
40 L/min	V1030
60 L/min	V2050
Double acting	M
Single acting	M SA





V1837

V1030 M

V2050 M

Performance	V1837	V1030 M	V2050M
Rated flow litres per minute	27	40	60
Maximum pressure bar	210	210	210
Pilot ratio	2.25:1	4:1	3.28:1
Port size	G3/8	G3/8	G1/2

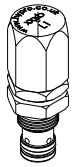
Weights

V1837	0.28 kg
V1030 M	0.95 kg
V2050 M	1.28 kg

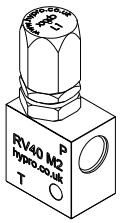
Hy-Pro
motion and control solutions

RV40 DIRECT ACTING RELIEF VALVE

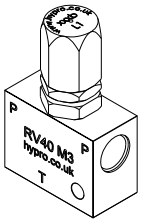
The RV40 is a direct acting cartridge valve. It is used in a range of inline mounted manifolds with 3 or 4 G3/8 Ports or as a stand lone cartridge for incorporation in to your manifold. The dual line manifold with two cartridges is commonly used to prevent shock loads in hydraulic motors and equal ended cylinders.
Adjustments are made using the cap and lock nut, which can be supplied tamper evident and pre-set if desired.



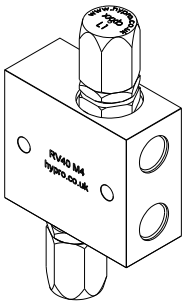
RV40DSNXXXC



RV40DSNXXXM2



RV40DSNXXXM3



RV40DSNXXXM4

Performance

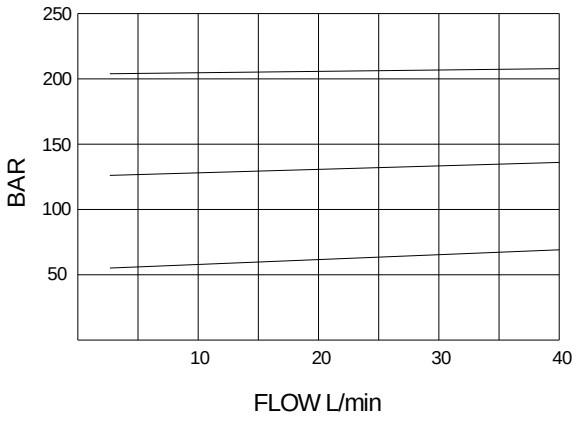
Rated flow	40 l/min
Max pressure	250 bar
Manifold ports	G3/8
Relief re-seat	80% of setting
Range	30-250 bar (ref options)

Installation Torque

Cartridge	27 Nm
Lock Nut	8 Nm

Weights

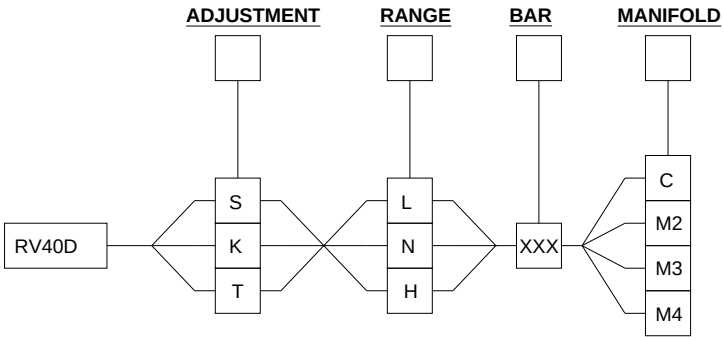
RV40DSNC	0.13 kg
RV40DSNM2	0.20 kg
RV40DSNM3	0.22 kg
RV40DSNM4	0.54 kg



Hy-Pro
motion and control solutions

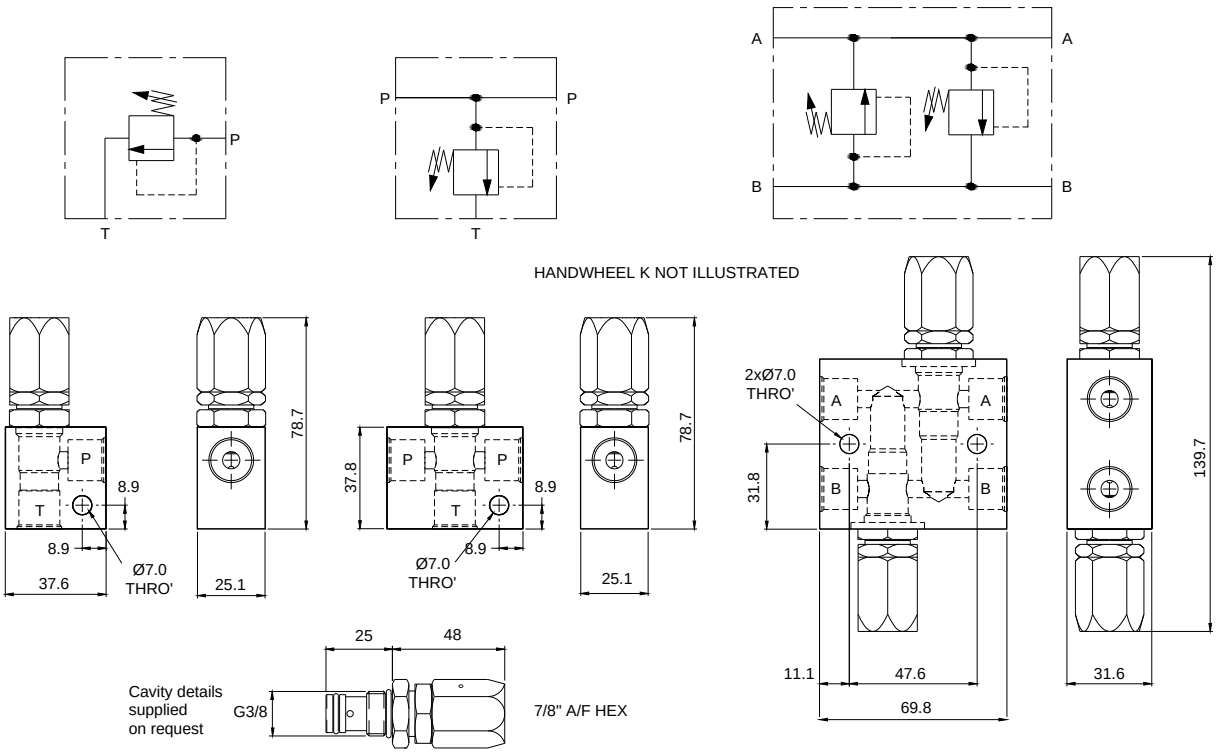
RV40 DIRECT ACTING RELIEF VALVE

Option	Code
Screw adjustment	S
Knob adjustment	K
Tamper Evident	T
30-70 Bar	L
50-200 Bar	N
100-250 Bar	H
Setting	XXX
Cartridge only	C
2 Port manifold	M2
3 Port manifold	M3
Dual relief valves	M4



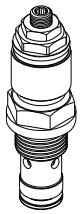
'XXX' = relief valve setting in bar

RV40DSNXXXM2 RV40DSNXXXM3 RV40DSNXXXM4

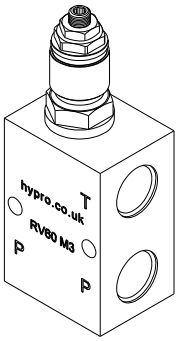


RV60 DIRECT ACTING RELIEF VALVE

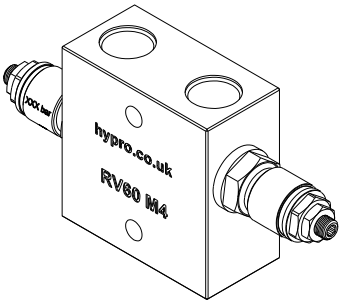
The 60 L/min relief valve is a fast acting direct acting cartridge valve. It is used in a range of inline mounted manifolds with 3 or 4 G1/2 Ports or as a stand lone cartridge for incorporation in to your manifold. The dual line manifold with two cartridges is commonly used to prevent shock loads in hydraulic motors and equal ended cylinders.
Adjustments are made using the socket screw and lock nut, which can be fitted with an optional tamper evident cap. Alternatively a hand wheel adjuster can be specified.



RV60DSNXXXC



RV60DSNXXXM3



RV60DSNXXXM4

Performance

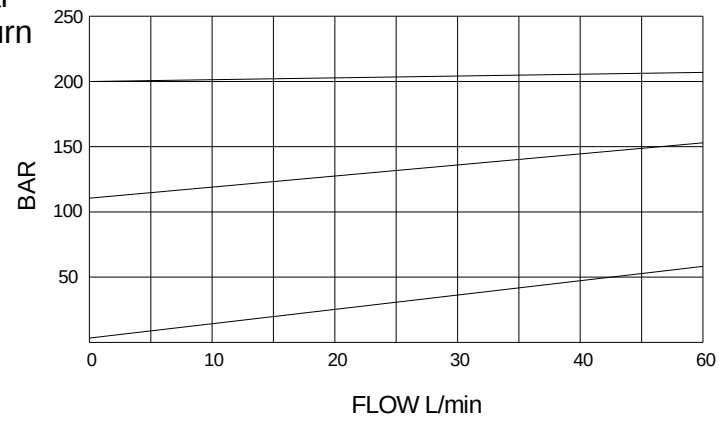
Rated flow	60 L/min
Max pressure	250 bar
Range	25 to 250 bar
Rate	25 bar per turn
Manifold ports	G1/2

Installation Torque

Cartridge	27 Nm
Lock Nut	8 Nm

Weights

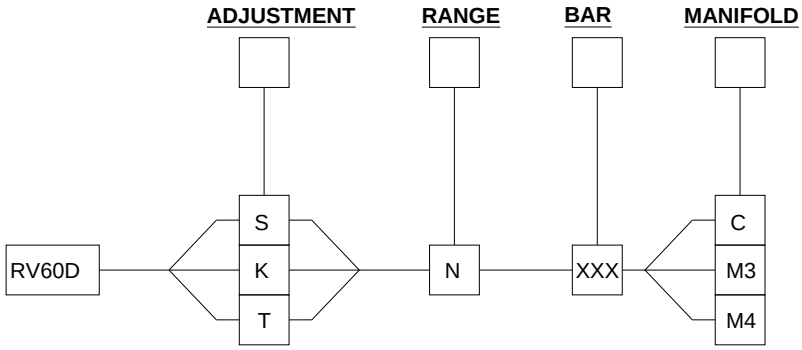
RV60DSNC	0.13 kg
RV60DSNM3	0.44 kg
RV60DSNM4	0.73 kg



Hy-Pro
motion and control solutions

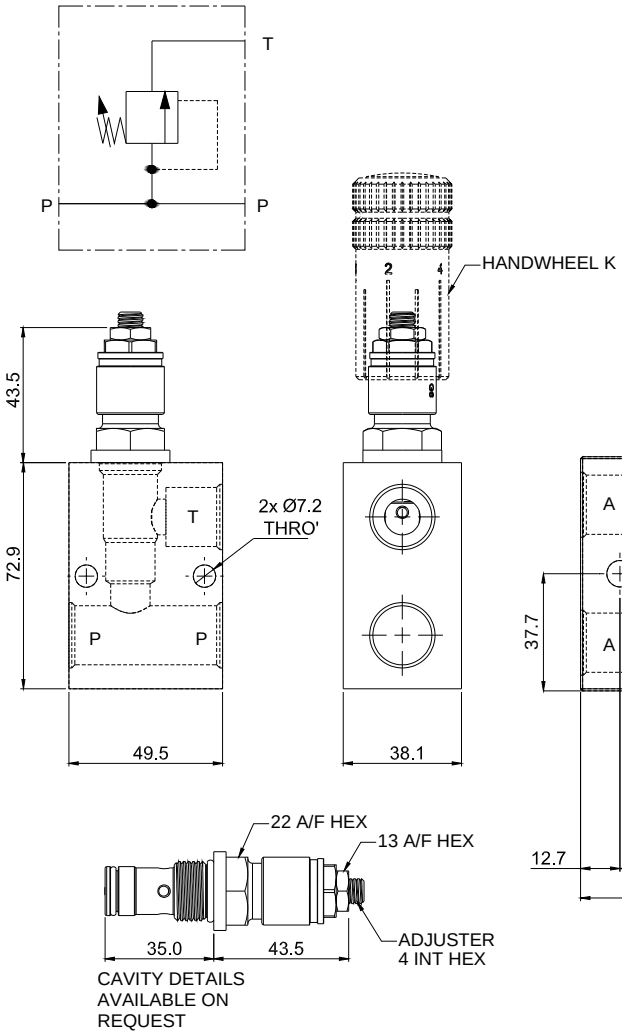
RV60 DIRECT ACTING RELIEF VALVE

Option	Code
Screw adjustment	S
Hand wheel	K
Tamper Evident	T
25 -250 bar	N
Setting	XXX
Cartridge only	C
3 Port manifold	M3
Dual relief valves	M4

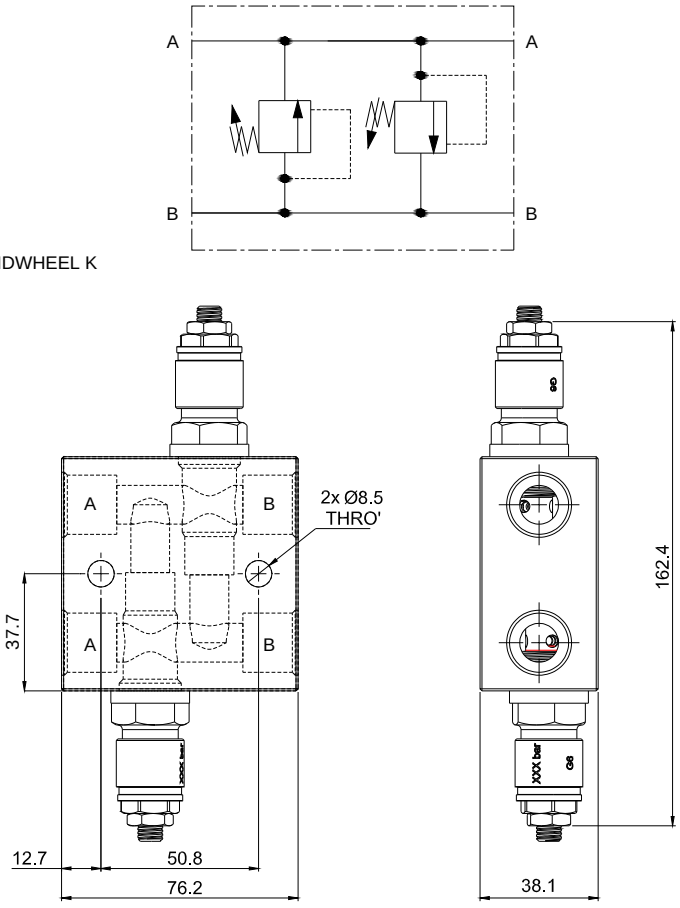


'XXX' = relief valve setting in bar

RV60DSNXXXM3

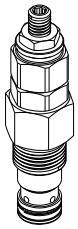


RV60DSNXXXM4

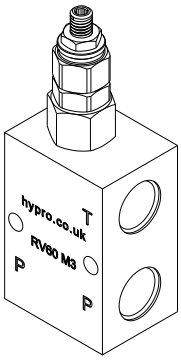


RV60 PILOT OPERATED RELIEF VALVE

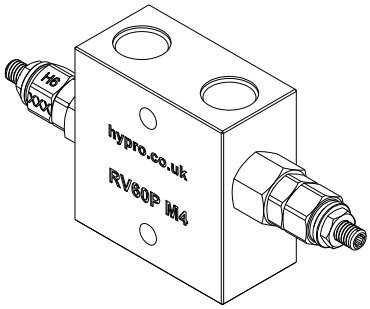
The RV60P is a pilot operated relief valve cartridge. They can be used in the Hy-Pro range or V4-40 and V5-60 sectional valves or as an inline valve with a manifold. Two relief valves together in a manifold give dual line relief commonly used to prevent shock loads in hydraulic motors and equal ended cylinders.



RV60PSNXXXC



RV60PSNXXXM3



RV60PSNXXXM4

Performance

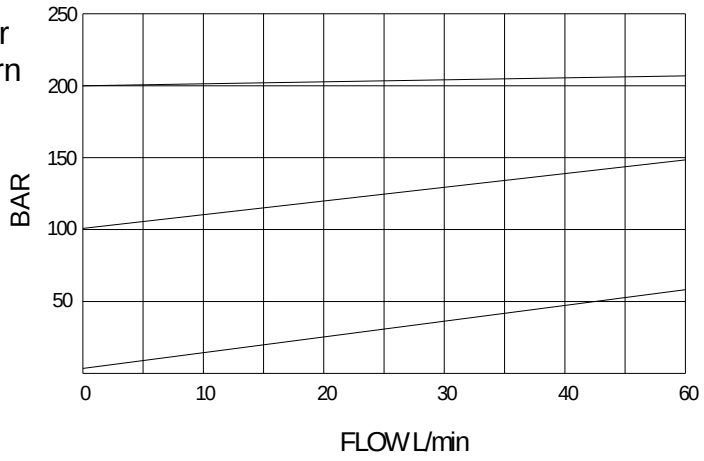
Rated flow	60 L/min
Max pressure	250 bar
Range	20 to 250 bar
Rate	63 bar per turn
Manifold ports	G1/2

Installation Torque

Cartridge	27 Nm
Lock Nut	8 Nm

Weights

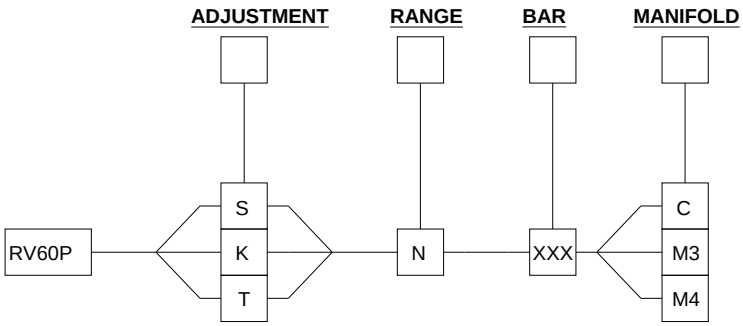
RV60PSNC	0.13 kg
RV60PSNM3	0.44 kg
RV60PSNM4	0.73 kg



Hy-Pro
motion and control solutions

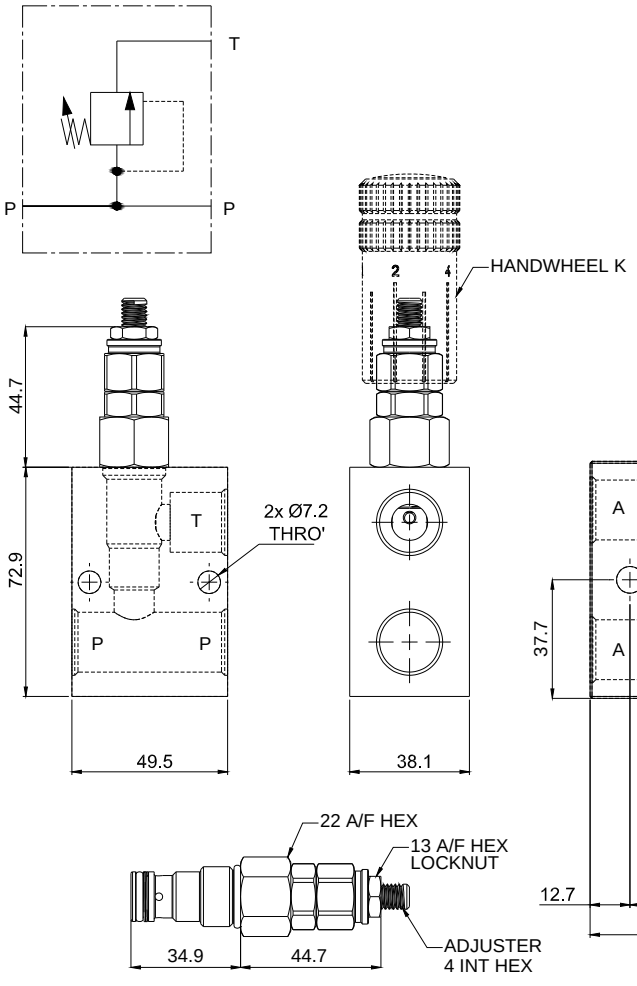
RV60 PILOT OPERATED RELIEF VALVE

Option	Code
Screw adjustment	S
Handwheel	K
Tamper Evident	T
20 - 250 bar	N
Setting	XXX
Cartridge only	C
3 Port manifold	M3
Dual relief valves	M4

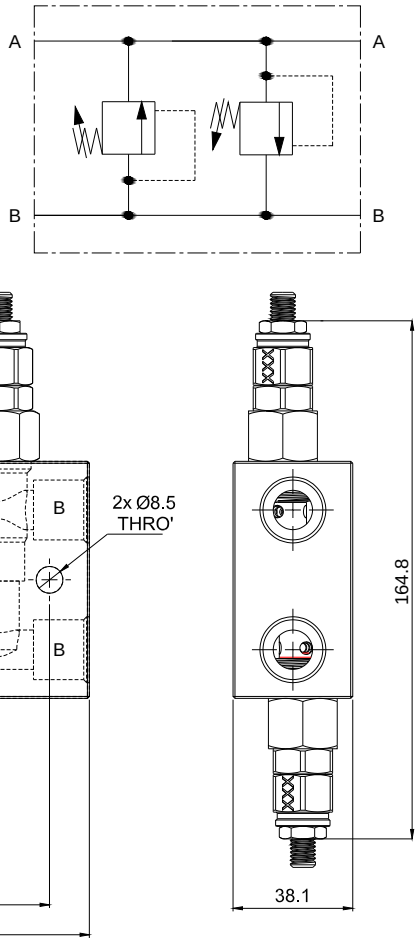


'XXX' = relief valve setting in bar

RV60PSNXXXM3



RV60PSNXXXM4

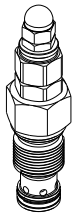


CAVITY DETAILS
AVAILABLE ON
REQUEST

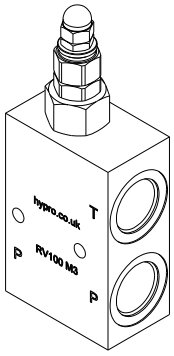
Hy-Pro
motion and control solutions

RV100 PILOT OPERATED RELIEF VALVE

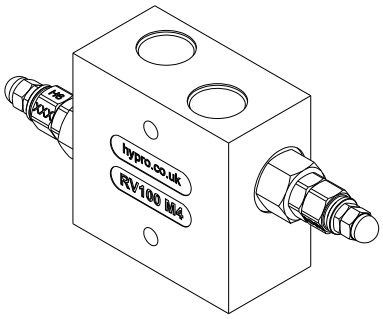
The RV100 relief valve is a very reliable, pilot operated cartridge valve, with excellent repeatability. Available as a cartridge to fit a standard Hy-Pro cavity or in a range of single and twin cartridge manifolds. The twin cartridge, 4 ported manifold is commonly used to prevent shock loads in hydraulic motors and equal ended cylinders.



RV100PSNXXXC



RV100PSNXXXM3



RV100PSNXXXM4

Performance

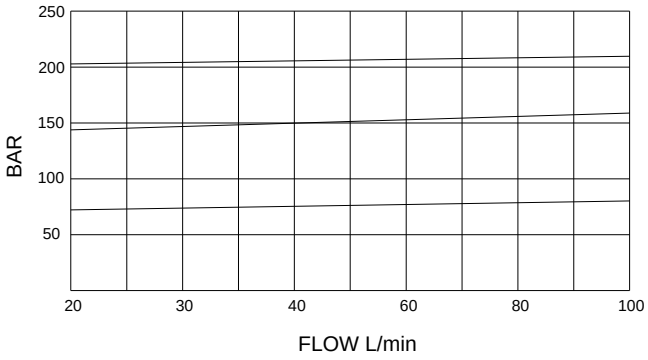
Rated flow	100 L/min
Max pressure	250 bar
Manifold ports	G3/4
Adjustment	70 Bar/turn

Installation Torque

Cartridge	27 Nm
Lock Nut	8 Nm

Weights

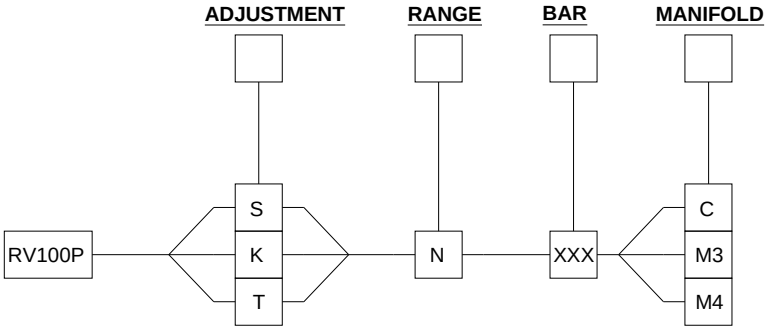
RV100 PSNXXXC	0.19 kg
RV100PSNXXXM3	0.64 kg
RV100PSNXXXM4	1.23 kg



Hy-Pro
motion and control solutions

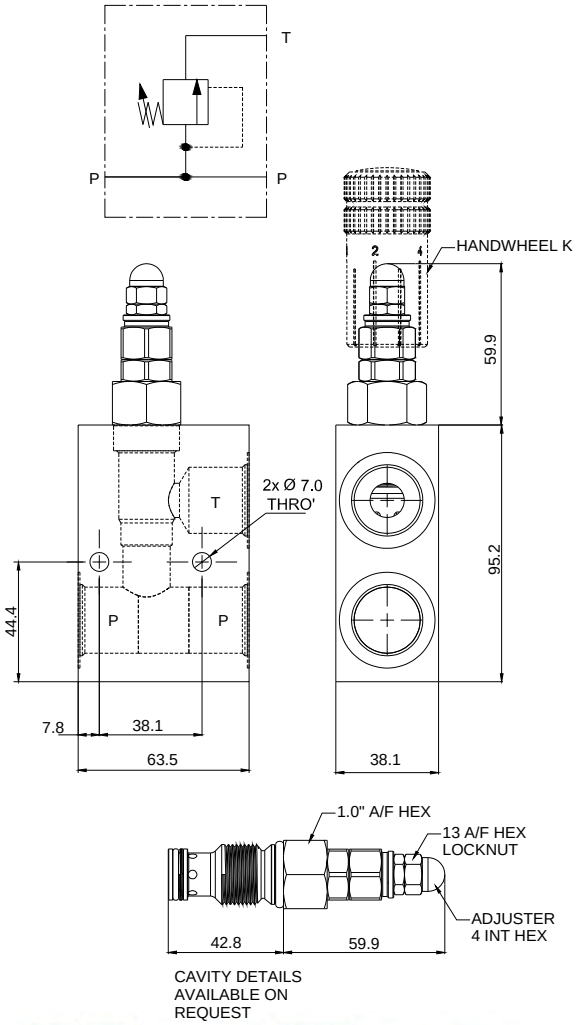
RV100 PILOT OPERATED RELIEF VALVE

Option	Code
Screw adjustment	S
Handwheel	K
Tamper Evident	T
20-250 bar	N
Setting	XXX
Cartridge only	C
3 Port manifold	M3
Dual relief valves	M4

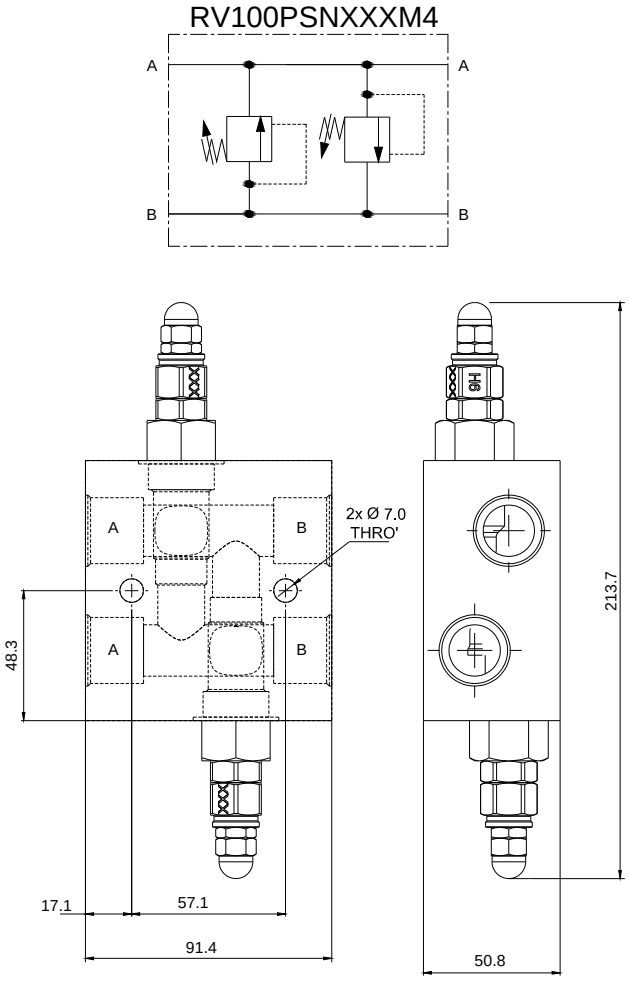


'XXX' = relief valve setting in bar

RV100PSNXXXM3



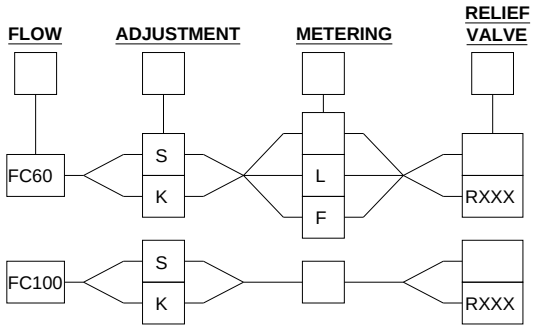
RV100PSNXXXM4



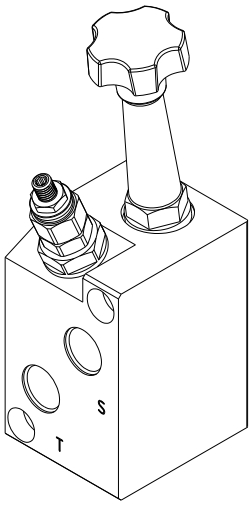
Hy-Pro
motion and control solutions

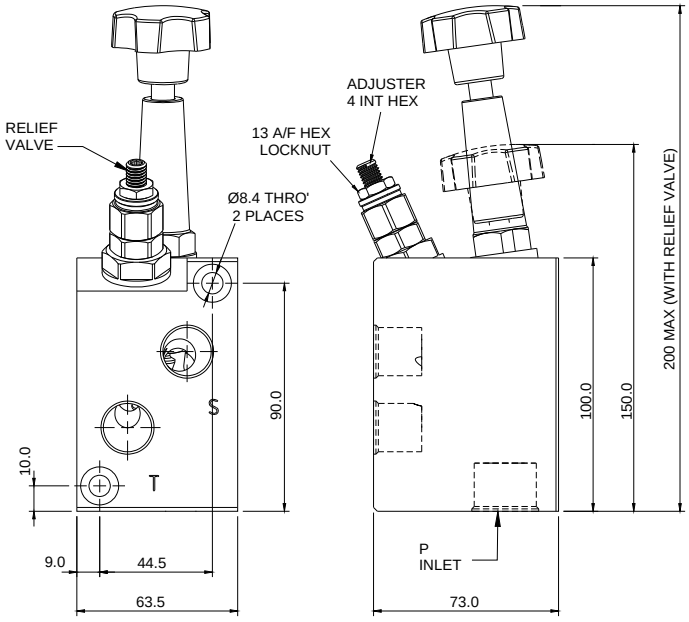
FC60 & FC100 FLOW CONTROL VALVES

Option	Code
60 L/min	FC60
100 L/min	FC100
Hand wheel	K
Screw adjust	S
Standard metering	-
Fine metering	F
1 Turn metering	L
Setting	RXXX*



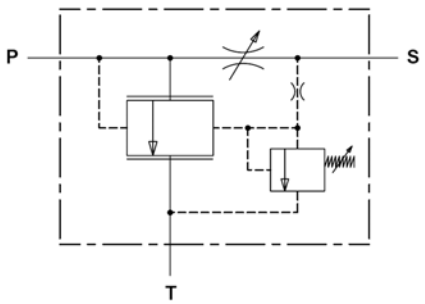
*XXX = Relief valve setting in Bar





Performance

Flow Range	FC60	0-60 L/min
	FC100	0-100 L/min
Relief Valve Range		20-250 bar
ΔP Inlet to service		6.9 bar
Max pressure		250 bar
Max back pressure bar		25
Pressure port		G3/4
Service ports FC60		G1/2
Service ports FC100		G3/4
Weight		1.5kg



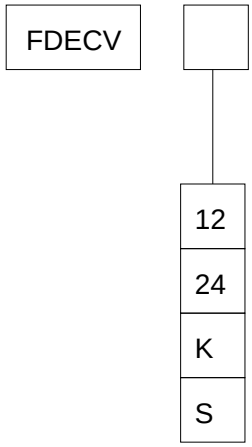
Hy-Pro
motion and control solutions

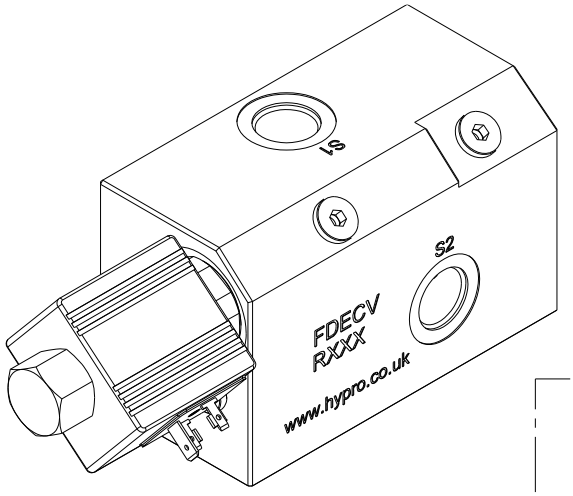
LINE MOUNTED PROPORTIONAL FLOW DIVIDER

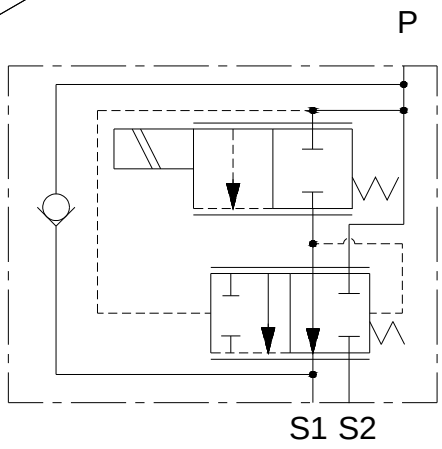
The adjustable priority flow is unaffected by variable pump delivery or pressure changes in either priority or secondary circuits. Control is via a proportional driver plug and 10KΩ Potentiometer. A manually controlled version is also available.

Option	**Code**
Proportional 12 VDC	12
Proportional 24 VDC	24
Manual handwheel	K
Manual Screw Adjuste	S

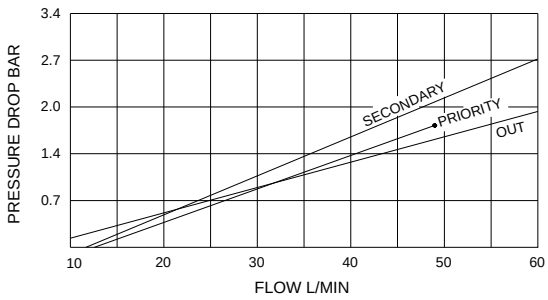
CONTROL





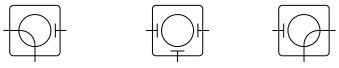
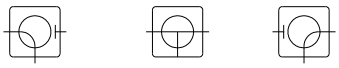
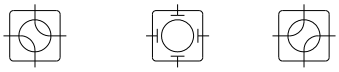
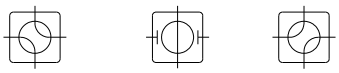
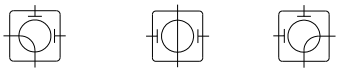


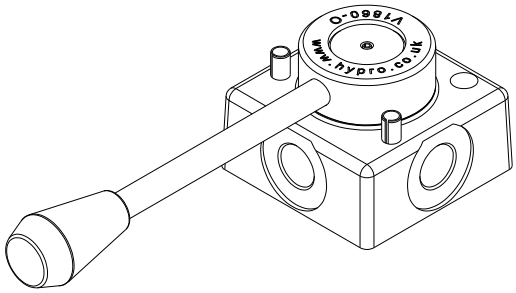
Priority flow	0-60 L/min
Secondary flow	0-60 L/min
∆P inlet to tank 40 lpm	2.0 bar
∆P inlet to priority service 40 L/min	1.6 bar
∆P inlet to secondary service 40 L/min	2.0 bar
Maximum pressure	210 bar
Coil Power	28 Watts
Coil Max Current	3.4 Amps @ 20°C
Body	Aluminium
Weight	1.5 Kg
Width	70mm

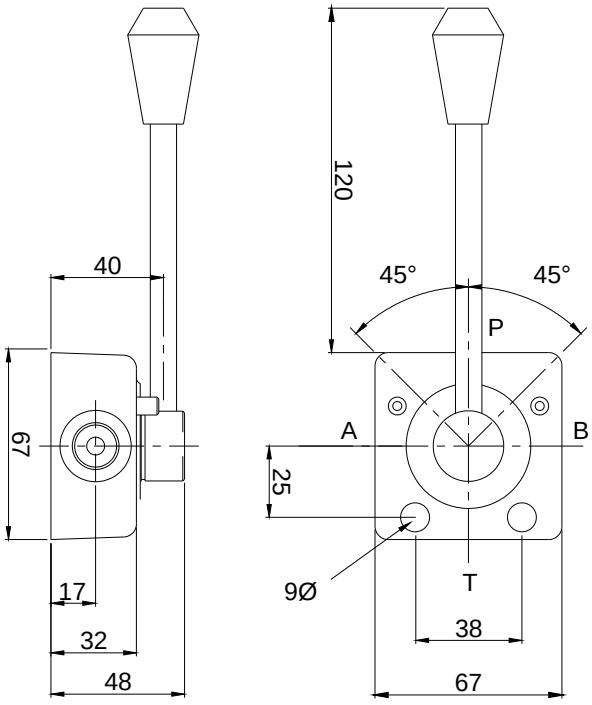


Hy-Pro
motion and control solutions

G3/8 ROTARY DIVERTER VALVES

V1660 C		3 Port closed centre - red knob
V1660 O		3 Port open centre - black knob
V1860 C		4 Port closed centre - blue knob
V1860 O		4 Port open centre - black knob
V1860 D		4 Port diverter - blue knob





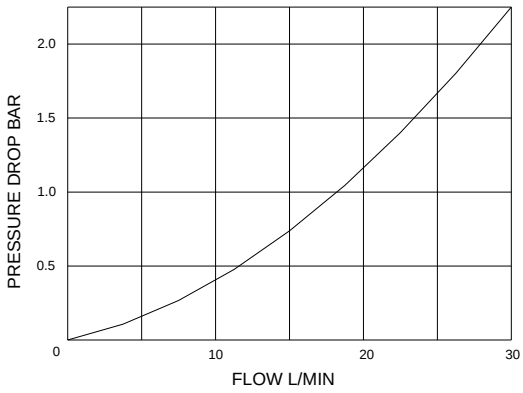
Performance

Ports	G3/8
Rated flow	27 l/min
ΔP at rated flow	1.7 bar
Maximum pressure	210 bar

Weights

Three port	1.14 kg
Four port	1.03 kg

TYPICAL PRESSURE DROP P-A/B

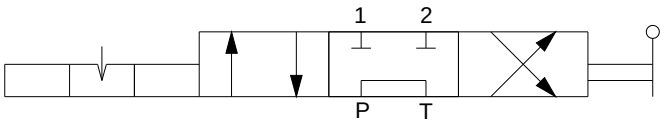


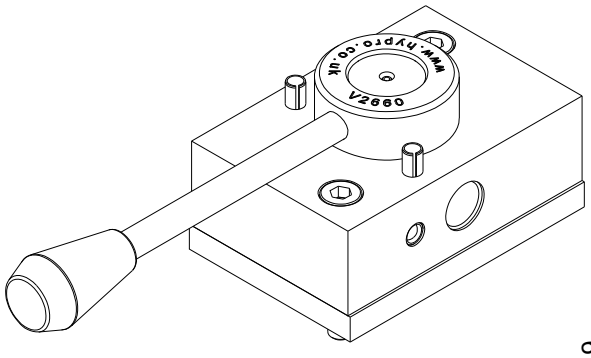
Hy-Pro
motion and control solutions

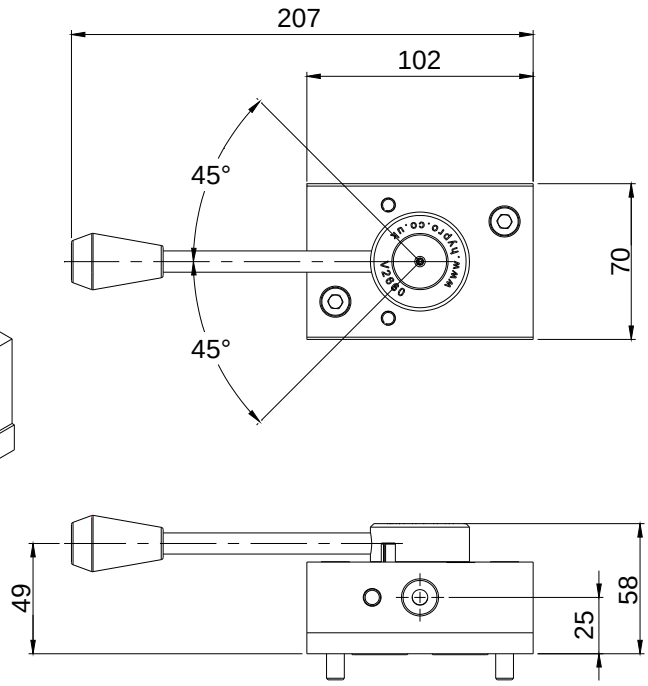
MOTOR REVERSING VALVE

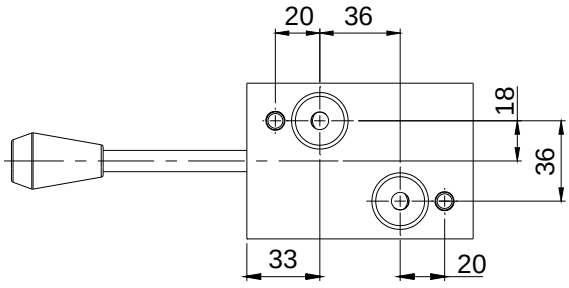
Designed to fit the Danfoss
OMP. OMH and OMR motors.

Option	**Code**
Reversing Valve	V2660
Sub-Plate OMP OMH OMR	V2661









Performance

Ports	G3/8
Maximum pressure	210 bar

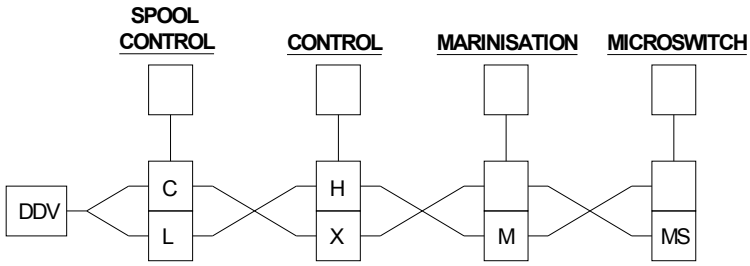
Weights

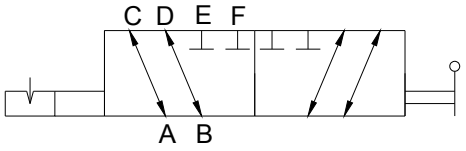
Including sub plate	1.85kg

Hy-Pro
motion and control solutions

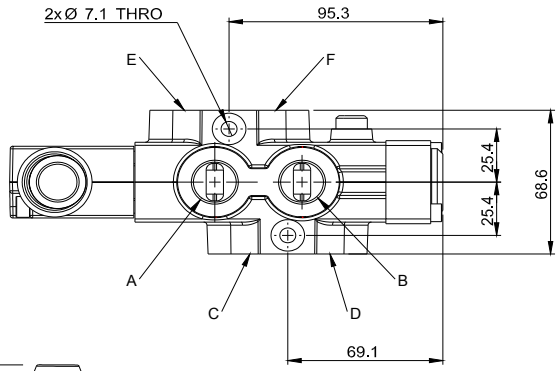
G1/2 6 PORT DIVERTER VALVE

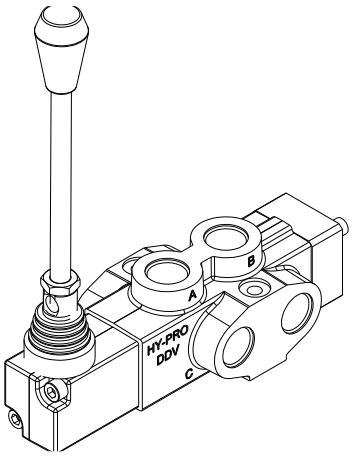
Option	Code
Spring centred	C
Detent	L
Lever	H
No lever	X
Marinisation	M
Microswitch	MS

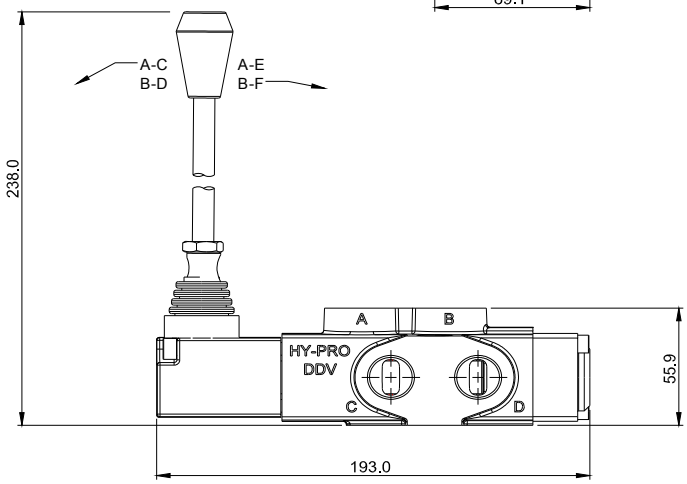




Underlapped spool



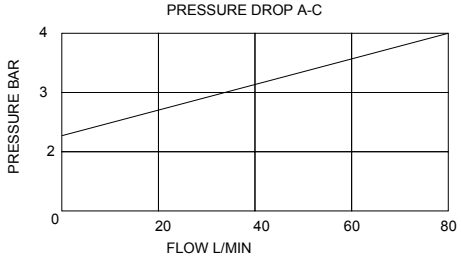




Performance

Rated flow	60 L/min
Maximum pressure	250 bar
Ports	G1/2
Spool Leakage 25°C	<10cc/min at 210bar

Weight 2.1 kg



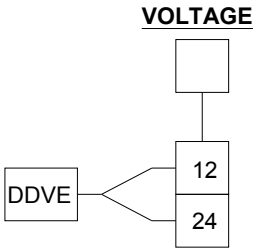
Hy-Pro
motion and control solutions

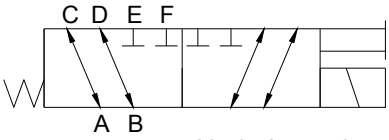
G1/2 6 PORT SOLENOID DIVERTER VALVE

The 6 port diverter valve is available with either solenoid or manual control. The manual version is available with either detent or spring-centred spool control.
A further option is the fitment of a micro-switch.

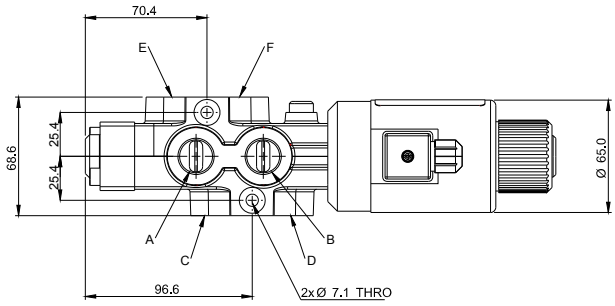
Both versions can be fitted with a pilot operated check valve acting on the E and F ports. Please contact us for details.

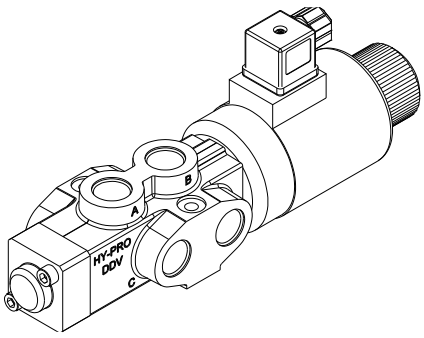
Option	Code
12 VDC	12
24 VDC	24

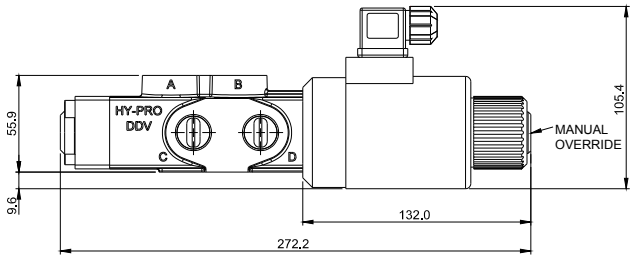




Underlapped spool





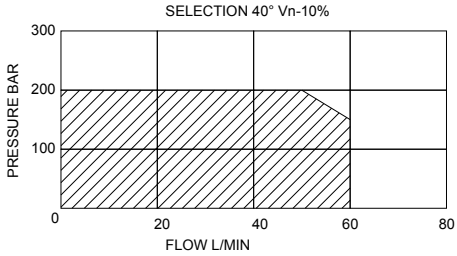


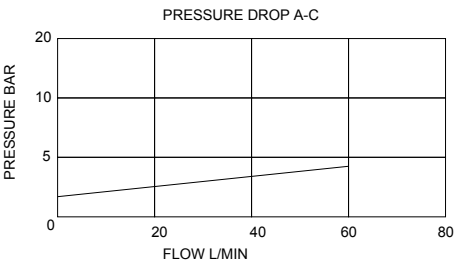
Performance

Rated flow	60 l/min
Maximum pressure	210 bar
Ports	G1/2
Spool Leakage @25°C	<10cc/min at 210 bar

Coil

Voltage	12 or 24 VDC
Power	60 Watts
Voltage	12 or 24 VDC ±10%
Connection	DIN43650
Protection	IP54
Weight	3.5 kg

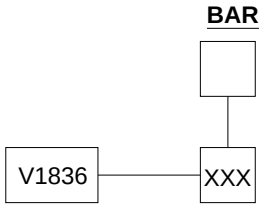




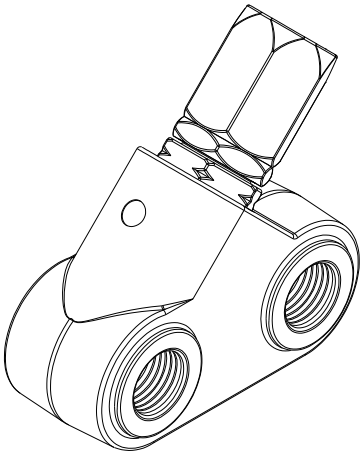
Hy-Pro
motion and control solutions

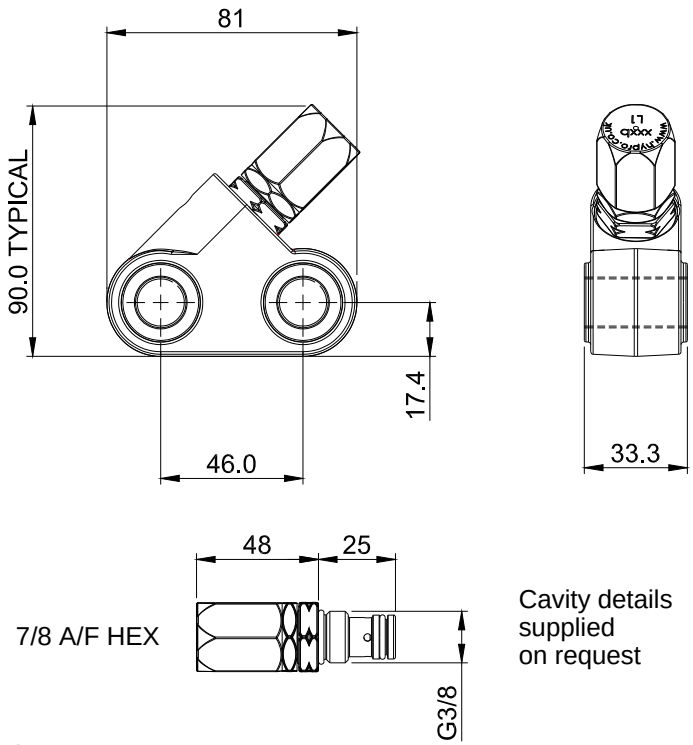
V1836 CROSS LINE RELIEF VALVE

The V1836 cross-line relief valve incorporates a special cartridge which can relieve pressure in 2 directions i.e pressure can be applied to both the nose and shoulder of the cartridge. This allows its manifold to be very compact. The setting is adjusted and set by means of the hex cap and locknut. They are commonly used with motors and balanced cylinders to prevent shock loads.



'XXX' = relief valve setting in bar
(Supplied at 140 unless stated)





Performance

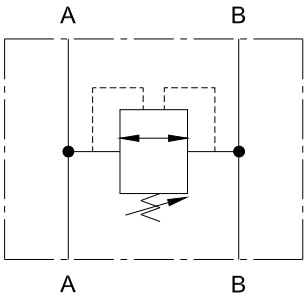
Rated flow	40 l/min
Max pressure	250 bar
Manifold ports	G3/8
Relief re-seat	80% of setting
Range	30-210 bar

Installation Torque

Cartridge	27 Nm
Lock Nut	8 Nm

Weight

V1836	0.33 kg



Hy-Pro
motion and control solutions

Hy-Pro

motion and control solutions

About Hy-Pro

Our in-house design and technical teams offer the expertise and support expected of an established world-class manufacturer. Our customers, ranging from the agricultural, transport, rail, fishing, construction and industrial sectors, expect named personal support, excellent quality and a rapid service with full back-up…
….we aim to deliver in full.

Call us today to discuss a bespoke solution from our extensive range or simply for competitively priced spares.

Full technical details of our entire range are available to download from our website

www.hypro.co.uk

Contact details:

Hydraulic Projects Limited
Dawlish Business Park
Dawlish
Devon
EX7 0NH
U.K

Tel: +44(0)1626 863634
Fax:+44(0)1626 866283

email: sales@hypro.co.uk
website: www.hypro.co.uk