


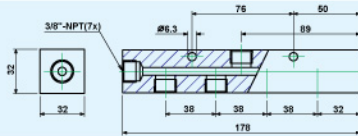

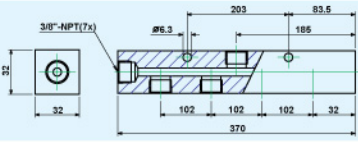

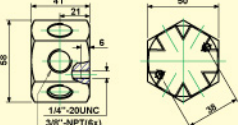

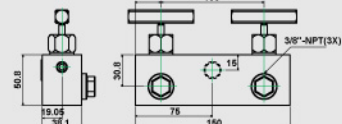

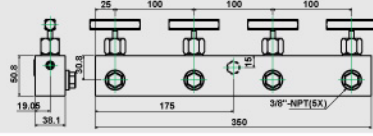

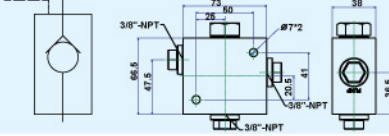

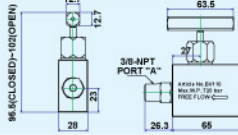

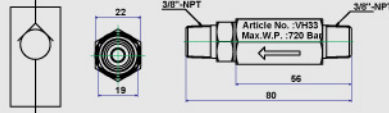
ACCESSORIES

Max. Working Pressure - 700 bar / 10,000 psi


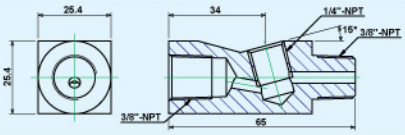

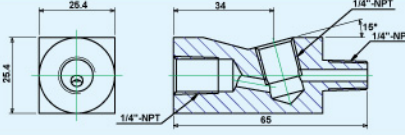

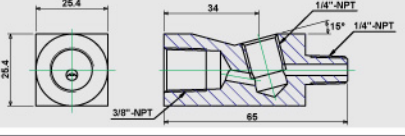

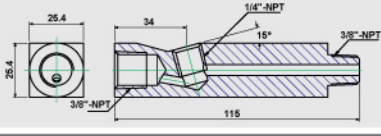
System Components

With the simple and complete line of hydraulic hoses, couplers, fittings, manifolds, gauges and valves, POWERRAM has the accessories to complete your hydraulic system and ensure the operating efficiency, long life and safety of your hydraulic equipment.

MANIFOLDS & FITTINGS

| Model No. | Dimensions (mm) | | Description |
|-----------|---|--|---|
| JP64 |  |  | 7 Female ports - 178 mm Long |
| JP65 |  |  | 7 Female ports - 370 mm long Available directly mounting of control valves |
| JP66 |  |  | 6-Port Hexagon Type |
| VB201 |  |  | Premounted Manifolds |
| VB401 |  |  | Available as split-flow valve to control two / four single-acting cylinders simultaneously. |
| BV42 |  |  | Pilot Check Valve |
| BV110 |  |  | Load Lowering Valve |
| VH33 |  |  | Non-return Valve |

GAUGE ADAPTORS

| Model No. | Dimensions (mm) | | Model No. | Dimensions (mm) | |
|-----------|---|---|-----------|--|---|
| E0567 |  |  | E1343 |  |  |
| E1336 |  |  | E1745 |  |  |

ACCESSORIES

Max. Working Pressure - 700 bar / 10,000 psi

FITTINGS

| Model No. | Description | Dimensions (mm) |
|-----------|-------------|-----------------|
| ADL101 | Elbow | |
| ADL102 | Elbow | |
| ADL202 | Elbow | |
| ADL303 | Elbow | |
| ADC303 | Elbow | |
| ADE303 | Elbow | |
| ADT101 | Tee | |
| ADT202 | Tee | |
| ADT303 | Tee | |
| ADG303 | Tee | |
| ADG323 | Tee | |
| ADF102 | Adaptor | |
| ADF203 | Adaptor | |
| ADF302 | Adaptor | |

| Model No. | Description | Dimensions (mm) |
|-----------|--------------------|-----------------|
| ADF303 | Adaptor | |
| ADF304 | Adaptor | |
| ADI202 | Connector | |
| ADI203 | Connector | |
| ADI303 | Connector | |
| ADO101 | Hexagon Nipple | |
| ADO202 | Hexagon Nipple | |
| ADO2031 | Reducing Connector | |
| ADO203 | Reducing Connector | |
| ADO204 | Hexagon Nipple | |
| ADO205 | Hexagon Nipple | |
| ADO303 | Hexagon Nipple | |
| BG9705 | Swivel Connector | |

ACCESSORIES

Max. Working Pressure - 700 bar / 10,000 psi

3-WAY Directional Control Valve

| Model No. | Description | Dimensions (mm) |
|-----------|---|-----------------|
| BP2 | 700 bar ; 17 l/min Manual, 2-position, Advance/Retract for single-acting cylinders | |


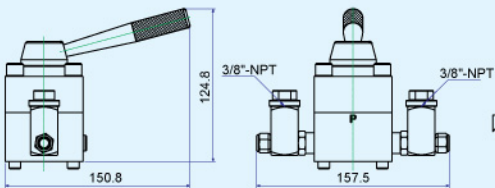
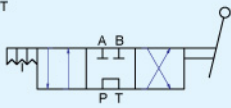

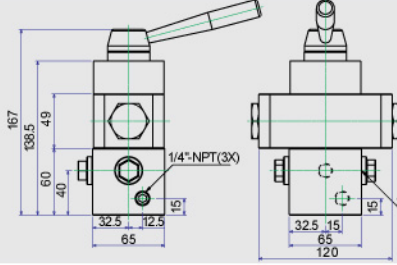
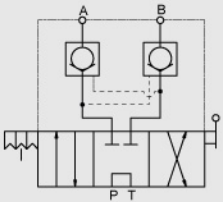

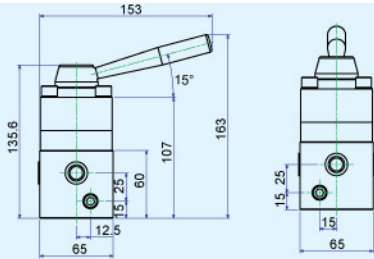
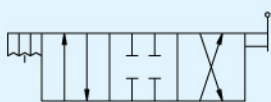
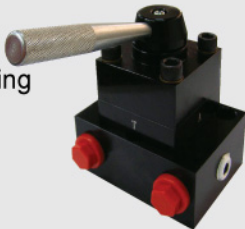
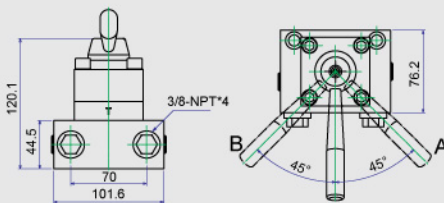


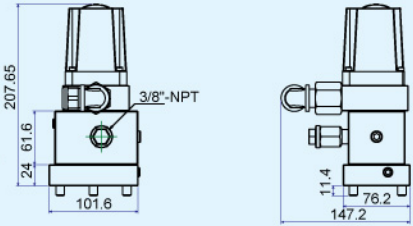
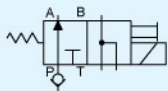

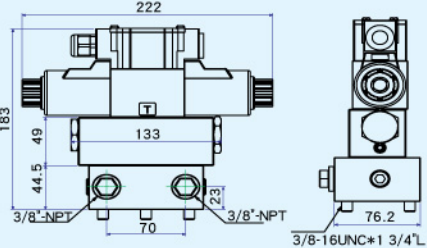
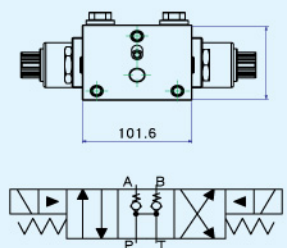
4-WAY Directional Control Valves

| Model No. | Description | Dimensions (mm) |
|-----------|---|-----------------|
| BP421 | For using with single- or double acting cylinders. Manual, Advance / Hold / Retract | |
| BP422 | | |
| BP423 | Manual, Advance / Hold / Retract Available models HP80D, AP13D, AP18D, EP13D, EP18D, EP211D, EP320D & EP420D | |
| BP42R | BP42R is the upper section of BP423 as enclosed only. | |
| BP425 | Manual, Advance / Hold / Retract, Lock for load holding. | |

ACCESSORIES

Max. Working Pressure - 700 bar / 10,000 psi


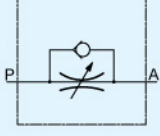

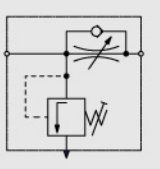

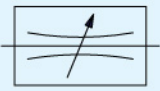

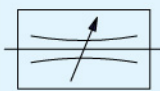

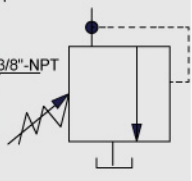

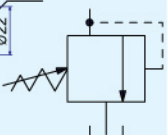
4-WAY Directional Control Valves

| Model No. | Description | Dimensions (mm) | | |
|-----------|--|---|--|---|
| BP426 | BP426 is similar to BP421, but used on HP35D only. |  |  |  |
| BP427 | Manual, Advance / Hold / Retract, Lock for load holding. |  |  |  |
| BP430 | BP430 is similar to BP422, but with closed center. |  |  |  |
| BP432 | Overlooking & mounting dimensions is same as BP423, but with closed center. |  |  |  |
| SV32 | 3 Way / 2 Position Solenoid Valve for Single-acting cylinders 24V / 110V / 220V |  |  |  |
| SV43 | 4 Way / 3 Position Solenoid Valve for Double-acting cylinders 24V / 110V / 220V |  |  |  |

ACCESSORIES

Max. Working Pressure - 700 bar / 10,000 psi

Flow Control Valves


| Model No. | Description | Dimensions (mm) |
|-----------|---|---|
| VC331 | Needle Valve To control cylinder speed, also can be used as shut-off valve for temporary holding. But not recommended to use for precise flow control. |   |
| VB66 | Manually Operated Check Valve Used with single or double acting cylinders for load holding. Upon cylinder retracting, valve is manually opened to allow oil flowing back to the tank and with auto overload relief design. |   |
| VB101 | Needle Valve (3/8"NPT ports) To be used as shut-off valve for temporary holding. Same as VB66, but without auto overload relief design. |   |
| VB102 | Needle Valve (1/4"NPT ports) To be used as shut-off valve for temporary holding. Same as VB66 but without auto overload relief design |   |
| BG9623 | In-line Pressure Relief Valve Used with single or double acting cylinders for remote locations in a hydraulic circuit where maximum pressure requirements are less than basic overload setting in a pump. |   |
| PRV9633 | In-line Pressure Regulator Valve Used for single or double acting cylinders to permit adjusting operating pressures at various values below relief valve setting of pump. |   |

ACCESSORIES

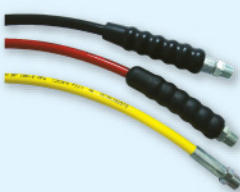
Max. Working Pressure - 700 bar / 10,000 psi

HOSES

- Heavy duty hoses rated at 700 bar, meet IJ-1000 specification as worldwide safety standards.
- Hoses are black rubber coated with two layers of steel braided reinforcement.
- Flexible hoses with spring guard at both ends to protect adaptors.

| Description | Model No. | End One | End Two | Length | | I/D | |
|--|-----------|----------|----------|--------|-------|--------|------|
| | | | | (feet) | (mtr) | (inch) | (mm) |
| Rubber Hoses  | HS225 | 1/4" NPT | 1/4" NPT | 5 | 1.5 | 1/4 | 6.4 |
| | HS235 | 1/4" NPT | 3/8" NPT | 5 | 1.5 | 1/4 | 6.4 |
| | HS226 | 1/4" NPT | 1/4" NPT | 6 | 1.8 | 1/4 | 6.4 |
| | HS236 | 1/4" NPT | 3/8" NPT | 6 | 1.8 | 1/4 | 6.4 |
| | HS332 | 3/8" NPT | 3/8" NPT | 2 | 0.6 | 1/4 | 6.4 |
| | HS333 | 3/8" NPT | 3/8" NPT | 3 | 0.9 | 1/4 | 6.4 |
| | HS335 | 3/8" NPT | 3/8" NPT | 5 | 1.5 | 1/4 | 6.4 |
| | HS336 | 3/8" NPT | 3/8" NPT | 6 | 1.8 | 1/4 | 6.4 |
| | HS337 | 3/8" NPT | 3/8" NPT | 7 | 2.1 | 1/4 | 6.4 |
| | HS338 | 3/8" NPT | 3/8" NPT | 8 | 2.4 | 1/4 | 6.4 |
| | HS3310 | 3/8" NPT | 3/8" NPT | 10 | 3.0 | 1/4 | 6.4 |
| | HS3312 | 3/8" NPT | 3/8" NPT | 12 | 3.6 | 1/4 | 6.4 |
| | HS3315 | 3/8" NPT | 3/8" NPT | 15 | 4.5 | 1/4 | 6.4 |
| | HS3320 | 3/8" NPT | 3/8" NPT | 20 | 6.0 | 1/4 | 6.4 |

| | | | | | | | |
|---|----------|----------|----------|----|-----|-----|-----|
| Rubber Hoses(High Flow)  | HFHS332 | 3/8" NPT | 3/8" NPT | 2 | 0.6 | 3/8 | 9.4 |
| | HFHS333 | 3/8" NPT | 3/8" NPT | 3 | 0.9 | 3/8 | 9.4 |
| | HFHS335 | 3/8" NPT | 3/8" NPT | 5 | 1.5 | 3/8 | 9.4 |
| | HFHS336 | 3/8" NPT | 3/8" NPT | 6 | 1.8 | 3/8 | 9.4 |
| | HFHS338 | 3/8" NPT | 3/8" NPT | 8 | 2.4 | 3/8 | 9.4 |
| | HFHS3310 | 3/8" NPT | 3/8" NPT | 10 | 3.0 | 3/8 | 9.4 |

| | | | | | | | |
|---|---------|----------|----------|----|-----|-----|-----|
| Polyurethane Hose  | PHS332 | 3/8" NPT | 3/8" NPT | 2 | 0.6 | 1/4 | 6.3 |
| | PHS333 | 3/8" NPT | 3/8" NPT | 3 | 1.0 | 1/4 | 6.3 |
| | PHS335 | 3/8" NPT | 3/8" NPT | 5 | 1.5 | 1/4 | 6.3 |
| | PHS336 | 3/8" NPT | 3/8" NPT | 6 | 1.8 | 1/4 | 6.3 |
| | PHS337B | 3/8" NPT | 3/8" NPT | 7 | 2.1 | 1/4 | 6.3 |
| | PHS338 | 3/8" NPT | 3/8" NPT | 8 | 2.4 | 1/4 | 6.3 |
| | PHS3310 | 3/8" NPT | 3/8" NPT | 10 | 3.0 | 1/4 | 6.3 |
| | PHS3312 | 3/8" NPT | 3/8" NPT | 12 | 3.6 | 1/4 | 6.3 |
| | PHS3315 | 3/8" NPT | 3/8" NPT | 15 | 4.5 | 1/4 | 6.3 |
| | PHS3320 | 3/8" NPT | 3/8" NPT | 20 | 6.0 | 1/4 | 6.3 |
| | PHS3330 | 3/8" NPT | 3/8" NPT | 30 | 9.0 | 1/4 | 6.3 |

| | | | | | | | |
|---|----------|----------|----------|----|-----|-----|-----|
| Polyurethane Hose (High Flow)  | HPHS332 | 3/8" NPT | 3/8" NPT | 2 | 0.6 | 3/8 | 9.7 |
| | HPHS333 | 3/8" NPT | 3/8" NPT | 3 | 1.0 | 3/8 | 9.7 |
| | HPHS335 | 3/8" NPT | 3/8" NPT | 5 | 1.5 | 3/8 | 9.7 |
| | HPHS336 | 3/8" NPT | 3/8" NPT | 6 | 1.8 | 3/8 | 9.7 |
| | HPHS338 | 3/8" NPT | 3/8" NPT | 8 | 2.4 | 3/8 | 9.7 |
| | HPHS3310 | 3/8" NPT | 3/8" NPT | 10 | 3.0 | 3/8 | 9.7 |
| | HPHS3312 | 3/8" NPT | 3/8" NPT | 12 | 3.6 | 3/8 | 9.7 |
| | HPHS3315 | 3/8" NPT | 3/8" NPT | 15 | 4.5 | 3/8 | 9.7 |
| | HPHS3320 | 3/8" NPT | 3/8" NPT | 20 | 6.0 | 3/8 | 9.7 |
| | HPHS3330 | 3/8" NPT | 3/8" NPT | 30 | 9.0 | 3/8 | 9.7 |

ACCESSORIES

POWERRAM
HYDRAULIC TOOLS

Max. Working Pressure - 700 bar / 10,000 psi



COUPLERS



| Description | Model No (Set) | Dimensions (mm) | Model No. |
|---|----------------|---|------------------|
|  | CP210 | NEEDLE (Plastic caps for both ends) RAM HALF: 1/4 NPT HOSE HALF: 1/4 NPT | CP211 CP212 |
|  | CP230 | NEEDLE (Metal cover for Ram half) RAM HALF: 1/4 NPT HOSE HALF: 1/4 NPT | CP231 CP232 |
|  | CP380 | NEEDLE (Plastic caps for both ends) RAM HALF: 3/8 NPT HOSE HALF: 3/8 NPT | CP381 CP382 |
|  | CP330B | BALL (Plastic caps for both ends) RAM HALF: 3/8 NPT HOSE HALF: 3/8 NPT | CP331B CP332B |
|  | CP350 | NEEDLE (Metal cover for Ram half) RAM HALF: 3/8 NPT HOSE HALF: 3/8 NPT | CP351 CP352 |
|  | CP430 | NO-SPILL RAM HALF: 3/8 NPT HOSE HALF: 3/8 NPT | CP431 CP432 |

HYDRAULIC OIL

- Used for 700 bar cylinders / hand pumps (transparent) and electric pumps (blue color).
- Contains anti-rust, anti-wear, anti-oxidant and anti-foaming additives.
- High quality hydraulic oil with low pour point.

| Model No. | Dimensions (mm) |
|-----------|--------------------------|
| HO1L | ISO 15 Grade, 1L Package |
| HO2L | ISO 15 Grade, 2L Package |
| HO4L | ISO 15 Grade, 4L Package |
| HO5L | ISO 15 Grade, 5L Package |




GAUGES

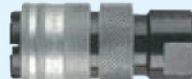


| Description | Model No. | Dimensions (mm) |
|--|-----------|---|
|  | M0039 | Liquid filled dampens needle vibration. Calibrated to read in bar, psi. Dial - 2-1/2" ; Thread Size: 1/4NPT Accuracy, Meet DIN Standard $\pm 1.6\%$ of full scale. |
|  | M0136 | All Features same as M0039 Except with Dial - 100 mm. |

Extra High Pressure Couplers: 2,000 bar & 3,000 bar

POWERRAM
HYDRAULIC TOOLS



| | | Part No. | Connection | Length | Diameter | Hexagon | Con. stroke | Weight (g) | Rec. torque (Nm) | Rec. Sealing method |
|-----------|---|-------------|------------|--------|----------|---------|-------------|------------|------------------|---------------------|
| COUPLINGS | Female thread | 10 125 1202 | G 1/4" | 64.3 | 30.0 | 24 | 20.2 | 210 | 40-50 | CMS |
| |  | | | | | | | | | |
| NIPPLES | Female thread | 10 125 6202 | G 1/4" | 38.0 | 25.4 | 22 | - | 60 | 40-50 | CMS |
| |  | | | | | | | | | |
| | Male thread without valve | 10 125 5252 | G 1/4" | 42.5 | 25.4 | 22 | - | 65 | 100-110 | Washer (2*) |
| |  | | | | | | | | | |

| | | Part No. | Connection | Length | Diameter | Key handle | Con. stroke | Weight (g) | Rec. torque (Nm) | Rec. Sealing method |
|-----------|---|-------------|------------|--------|----------|------------|-------------|------------|------------------|--|
| COUPLINGS | female thread with 60° sealing cone (interchangeable with both nipple designs) | 10 135 1505 | M16x1.5 | 64.0 | 30.0 | 22 | 20.6 | 210 | 40-50 | |
| |  | | | | | | | | | Max. working pressure: 300 MPa Min. bursting pressure: 600 MPa Temperature range: -20° C - +80° C (0°F - +175°F) Max. no. of pressure cycles (to max. working pressure) connected with: nipple 10 135 6505: 1000 nipple 10 135 6506: 5000 |
| NIPPLES | Female thread with 60° sealing cone Standard design | 10 135 6505 | M16x1.5 | 55.3 | 25.0 | 22 | - | 125 | 40-50 | |
| |  | | | | | | | | | Max. working pressure: 300 MPa Min. bursting pressure: 600 MPa Temperature range: -20° C - +80° C (0°F - +175°F) Max. no. of pressure cycles connected (to max. working pressure): 1000 |
| | Female thread with 60° sealing cone Non-swivel design | 10 135 6506 | M16x1.5 | 55.3 | 25.0 | 22 | - | 125 | 100-110 | |
| |  | | | | | | | | | Max. working pressure: 300 MPa Min. bursting pressure: 600 MPa Temperature range: -20° C - +80° C (0°F - +175°F) Max. no. of pressure cycles connected (to max. working pressure): 5000 Non-swivel model. Six optional positions are possible when connecting. |

All stainless steel pressure gauges according to EN 837-1

POWERRAM
HYDRAULIC TOOLS

Nominal sizes ND 100 / 160
Connection position
bottom, radial

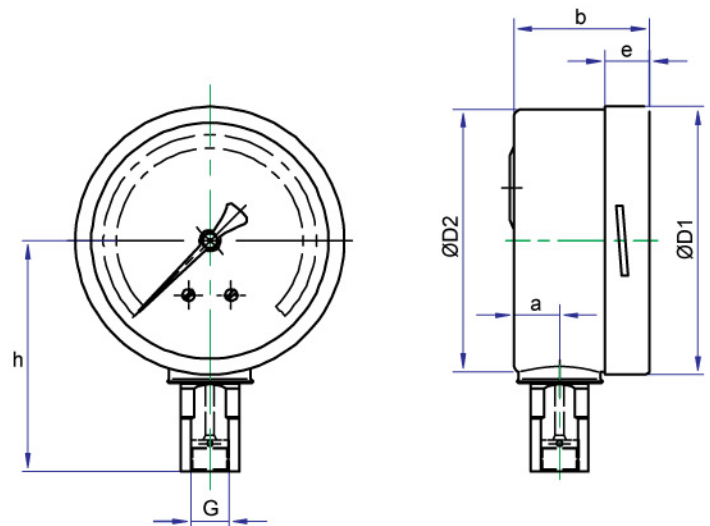


FEATURES

- Measuring system made of high corrosion - resistant material.
- All stainless steel version compatible with most chemicals.
- Accuracy class KI.1.6
- Equipped with safety glass, blow out plug and restrictor.
- Vibration-free display and long service life by filling glycerine .

DESCRIPTION

Ideal for high demands on pressure test measurement in bending machine and apparatus construction.
The measuring system is of accuracy class 1.6 has overrange protection up to 1.1 times the max. rating and can be loaded up to the full scale value.



Model No.:P1710/P1714

MEASURING RANGES

0~1400 bar to 0~4000 bar

Applications

Machine and apparatus construction, special machinery and pumps

option: contact cover plastic, max. 2 contacts

data sheet DE 1227 exists in addition.

| Model No. | ND | a | b | D1 | D2 | e | G | h±1 | SW |
|-----------|-----|------|------|-----|-----|------|---------|-----|----|
| P1710 | 100 | 17,7 | 54 | 101 | 100 | 17,5 | M16x1,5 | 87 | 22 |
| P1714 | 160 | 15,4 | 49,5 | 161 | 160 | 17,5 | M16x1,5 | 125 | 22 |

Extra High Pressure Hoses

POWERRAM
HYDRAULIC TOOLS

Hose Type 5/4

Applications:

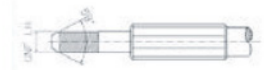
Waterblasting: Heat Exchanger Tube Cleaning
Hydraulics: Bolt Tensioning and Torque Tools, Hydraulic Jacks, Controls for Service Equipment, Instrumentation Packages for Gauges, Pressure Testing for Valves, Tooling and Control Panels, Hydraulic Tools
Oil and Gas: Chemical Injection, Gaseous Media Handling, Grease Injection, Hydraulic Control, Nitrogen Service



Inner Core: Polyoxymethylene(POM)
Pressure Support: 4 layers of high-tensile steel wire
Outer Cover: Polyamide(PA)
Colour: grey, other colours upon request
Temperature: -22°F to 140°F [-30°C to +60°C]

| ΦID | ΦOD | Working Pressure*) | Burst Pressure*) | Min. Bend Radius | Weight | Nipple ΦID | Sleeve | Sleeve ΦOD |
|-----------|-----------|--------------------|------------------|------------------|--------------|------------|--------------------------|------------|
| 0,20 inch | 0,44 inch | 26.100 psi | 65.250 psi | 5,91 inch | 0,175 lbs/ft | 0,10 inch | 10540101 carbon steel | 0,59 inch |
| 5,0 mm | 11,2 mm | 1.800bar | 4.500bar | 150 mm | 0,260 kg/m | 2,5 mm | 10540105 AISI 316 Ti | 15,0 mm |

| Description | Size | Material | Part Number |
|-------------------------------------|-----------------|---------------------------------|------------------------------|
| HP fitting | 1/4"x28 UNF LH | carbon steel | 40540211B |
| HP fitting | 1/4"x28 UNF LH | AISI 316 Ti | 40540215B |
| HP fitting BLAST PRO ²) | 1/4"x28 UNF LH | stainless steel carbon steel | 40540234Y sleeve/10540232 |
| HP fitting | 3/8"x24 UNF LH | AISI 316 Ti | 40540205B |
| HP fitting BLAST PRO ²) | 3/8"x24 UNF LH | stainless steel carbon steel | 40540214Y sleeve/10540232 |
| HP fitting | 9/16"x18 UNF LH | AISI 316 Ti | 40540225B |



Hose Type 5/6H

Applications:

Hydraulics: Bolt Tensioning and Torque Tools, Hydraulic Jacks, Controls for Service Equipment, Pressure Testing for Valves, Tooling and Control Panels
Waterblasting: Ultra High Pressure Waterjet Table Cutting, Ultra High Pressure Tube Cleaning, Surface Preparation, Paint Removal, Automated Cleaning Booths, Rotating Cleaning Device for Waterblast, Hydro Demolition of Concrete, Robotic Surface Cleaning of ships, Tank and Vessel Cleaning.



Inner Core: Polyoxymethylene(POM)
Pressure Support: 6 layers of high-tensile steel wire
Outer Cover: Polyamide(PA)
Colour: red, other colours upon request
Temperature: -22°F to 140°F [-30°C to +60°C]

| ΦID | ΦOD | Working Pressure*) | Burst Pressure*) | Min. Bend Radius | Weight | Nipple ΦID | Sleeve | Sleeve ΦOD |
|-----------|-----------|--------------------|------------------|------------------|--------------|------------|--------------------------|------------|
| 0,18 inch | 0,57 inch | 40.600 psi | 101500 psi | 8,66 inch | 0,378 lbs/ft | 0,08 inch | 10560122 carbon steel | 0,78 inch |
| 4,6 mm | 14,4 mm | 2.800 bar | 7.000 bar | 220 mm | 0,563 kg/m | 2,0 mm | | 19,7 mm |

| Description | Size | Material | Part Number |
|-------------|-----------------|-----------------|-------------|
| HP fitting | 1/4"x28 UNF LH | stainless steel | 40560294D |
| HP fitting | 3/8"x24 UNF LH | stainless steel | 40560284D |
| HP fitting | 9/16"x18 UNF LH | stainless steel | 40560264D |
| HP fitting | M14x1.5LH | stainless steel | 40540274D |



Extra High Pressure Hoses

POWERRAM
HYDRAULIC TOOLS

Hose Type 6/2

Duralife Flex™

Applications:

Waterblasting: Heat Exchanger Tube Cleaning
Hydraulics: Instrumentation Packages for Gauges, Pressure Testing for Valves, Tooling and Control Panels



Inner Core: Polyoxymethylene (POM)
Pressure Support: 2 layers of high-tensile steel wire
Outer Cover: Polyamide (PA)
Colour: green, other colours upon request
Temperature: -22°F to 140°F [-30°C to +60°C]

| ΦID | ΦOD | Working Pressure*) | Burst Pressure*) | Min. Bend Radius | Weight | Nipple ΦID | Sleeve | Sleeve ΦOD |
|-----------|-----------|--------------------|------------------|------------------|--------------|------------|--------------------------|------------|
| 0,25 inch | 0,45 inch | 14.500 psi | 36.250 psi | 4,33 inch | 0,118 lbs/ft | 0,16 inch | 10620101 carbon steel | 0,55 inch |
| 6,3 mm | 11,5 mm | 1.000 bar | 2.500 bar | 110 mm | 0,175 kg/m | 4,0 mm | | 13,9 mm |

| Description | Size | Material | Part Number | |
|-----------------------------------|-----------------|--------------|------------------------|--|
| HP fitting | 9/16"x18 UNF LH | AISI 316 Ti | 40620205A | |
| male fitting one piece waterblast | 1/4"x18 NPTF | carbon steel | 30620469WX/30620462/1X | |
| male fitting one piece waterblast | G1/4" | carbon steel | 30620369X/30620462/1X | |

Extra High Pressure Pumps

Page 20



Hand / Foot Pumps

Page 18-30



Extra High Pressure Accessory

Page 80-83



Power Pumps

Page 31-42



Aluminum Cylinders

Page 03-06



Cylinders

Page 07-17



SAFETY TIPS

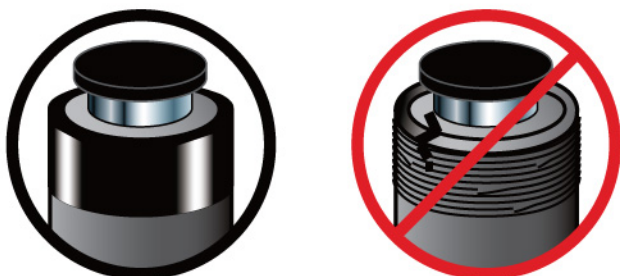
POWERRAM
HYDRAULIC TOOLS

1. Choose the right ram.



You must know the weight of what you intend to lift and choose a ram with at least 20% more capacity. Be aware of possible load shift requiring more capacity at the particular lifting point.

2. Check each components



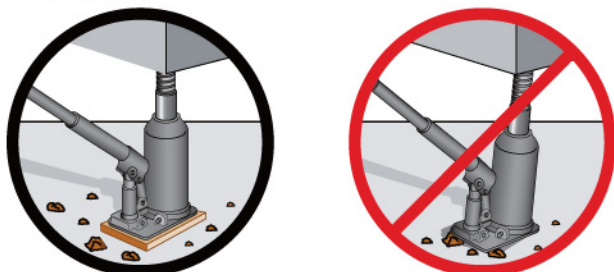
Check each component before you set up your hydraulic system. Do not use damaged or worn components. Turn them in for repair or replacement.

3. Safety instructions.



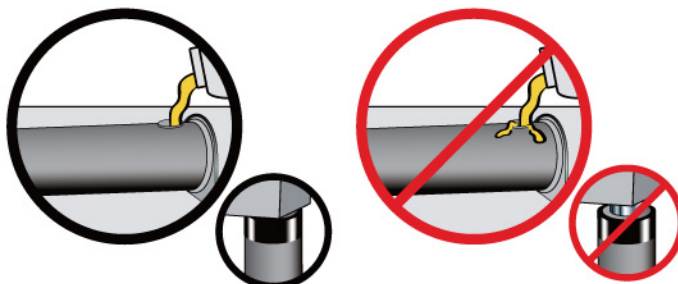
Read all warning labels and instructions. Operating instructions must be understood before using equipment. Never remove labels from equipment. Replace missing, worn, or damaged labels. Always wear safety goggles and protective clothing when using hydraulic equipment.

4. Each jack or ram must be fully supported at the base.



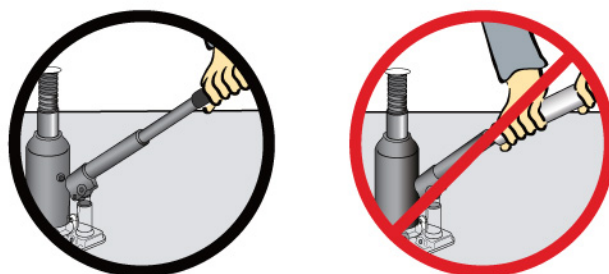
Every jack or ram, whether used individually or in a system, should be completely supported on a solid, firm, non-sliding foundation capable of supporting the load.

5. Fill oil reservoirs with cylinder retracted.



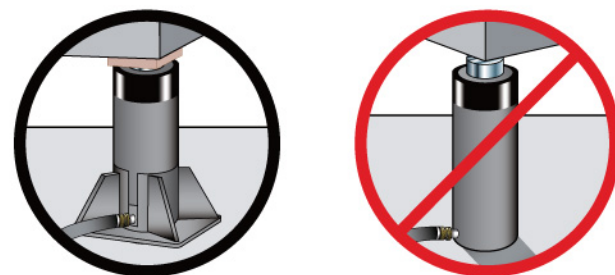
Only fill pump to recommended level, and fill only when the connected cylinder is fully retracted.

6. Know how your hydraulics work.



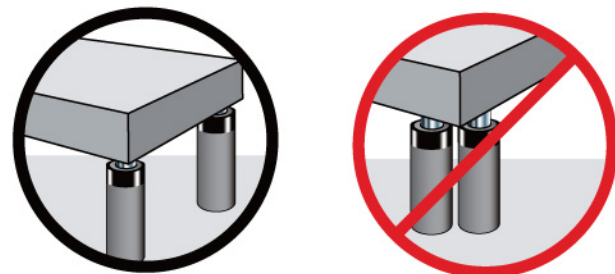
Do not use extensions or cheater bars on hydraulic jacks or hand pumps to raise a load.

7. Center the load on the lifting point.



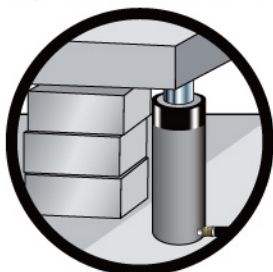
The load must be centered on the ram, or equally distributed on multiple rams. Off center loading can result in the ram slipping out and loss of the load.

8. When using multiple rams, distribute the load evenly.



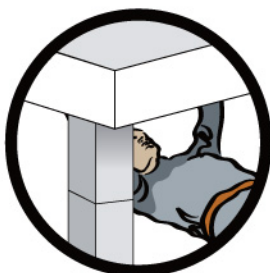
For multiple rams lift, you must be able to determine the location and number of lifting points that will allow the load to be evenly distributed to all the rams. This is called load balance. Size, center of gravity, and load geometry must be considered in order to correctly determine load balance.

9. Block or crib your load as it raises.



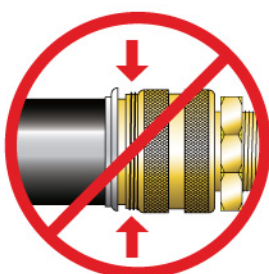
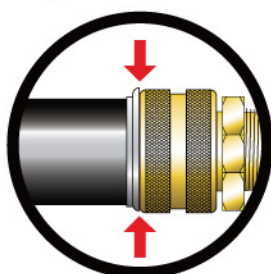
Place blocking or cribbing under the loads as you raise it. Each time you raise it higher, insert more blocking. Position yourself in a manner that will keep you clear of the load, and will not allow your hands or other body parts between the load and the cribbing.

10. Do not use rams as permanent supports.



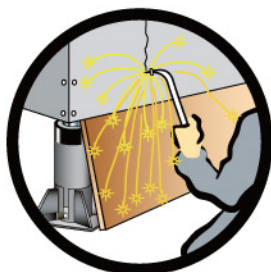
Hydraulic rams are not meant to be used as permanent supports, but are designed to lift and lower. If you need to hold the load for any length of time, cribbing or Powerram locknut cylinders should be used.

11. Hydraulic connections.



When making connections with quick couplers, make sure the couplings are fully engaged. Threaded connections such as fittings, gauges, etc. must be securely tightened and leak free. Never use excessive tightening force that may distort the fittings or strip the thread profile.

12. Avoid extreme heat or weld splatter.



Weld splatter will damage plunger rods and hoses. Hydraulic fluid can ignite if vaporized or exposed to high temperatures.

13. Disconnecting the hydraulics.



Never attempt to disconnect hydraulic hoses, fittings or couplers under pressure. Unload the ram, open the release screw on the hand pump and shift or open all hydraulic controls several times. If system includes a gauge, double check the gauge to insure pressure has been completely released.

14. Do not carry or drag pumps and rams by their hoses.



Dragging or carrying rams or pumps by a connected hose can damage the couplers and hoses. Using damaged couplers and hoses can be dangerous.

15. Keep hydraulic hoses free of obstructions.



Do not drop sharp or heavy objects on hose. Keep hose out of heavy traffic areas. This will cause internal damage to hose wire strands. Applying pressure to a damaged hose may cause it to rupture. Avoid sharp bends and kinks when routing hydraulic hoses.