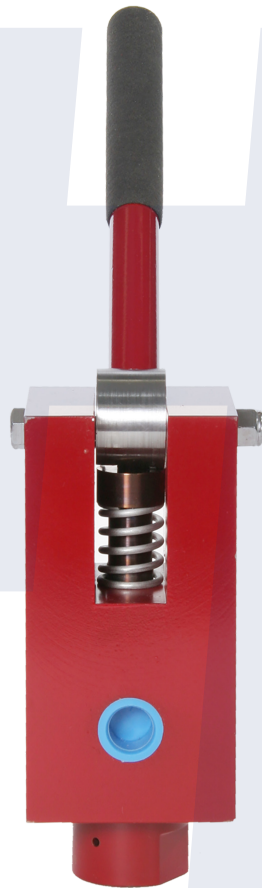


HR2-20 Hand Regulator



Instruction and Service Manual

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I. GENERAL INSTRUCTIONS

The Hydroplex model HR2-20 hand regulator is a precision designed and manufactured product, which, if properly operated, will give safe, reliable operation. Due to its high pressure capabilities care must be taken in its application, installation and operation. All personnel operating or maintaining this equipment should study this manual.

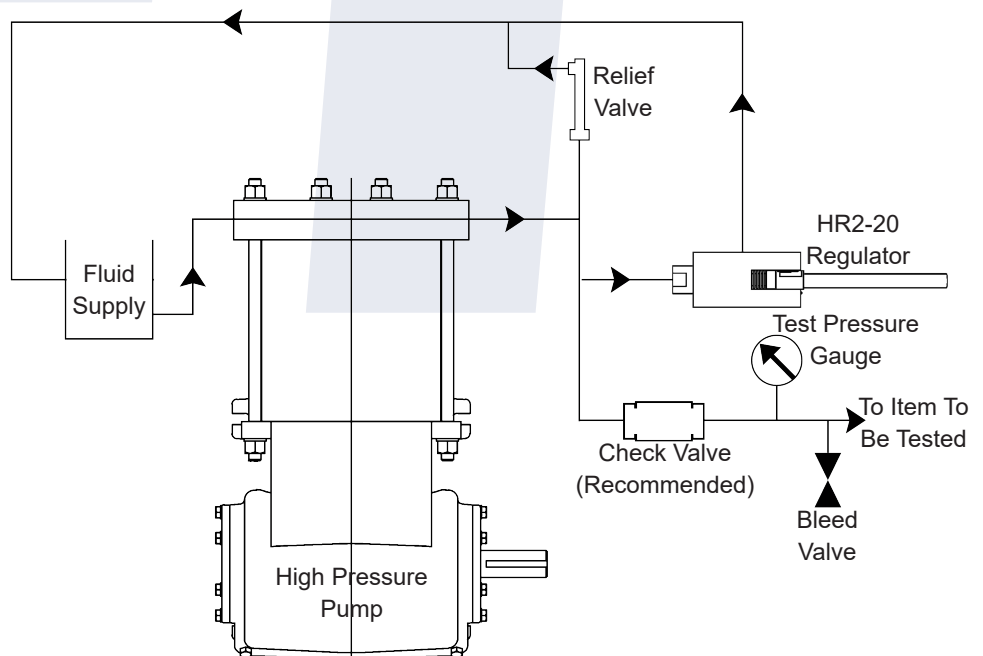
The purpose of the HR2-20 hand regulator is to manually regulate the discharge pressure from a high pressure source. The valve is spring loaded and normally open to automatically divert liquid at a very low pressure from the source back to a low pressure location when the handle is not activated. When the operating arm is moved by an operator, system pressure will be increased in proportion to the movement of the arm. Releasing of the arm will immediately drop the pump pressure back to a minimal level, while holding pressure past the downstream check valve.

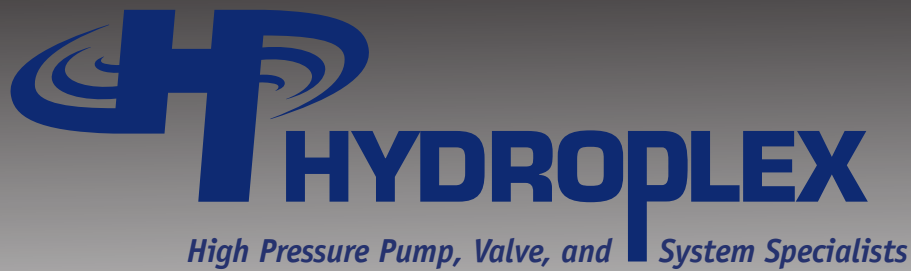
A. INSTALLATION

CAUTION

THE HR2-20 HAND REGULATOR CAN PRODUCE VERY HIGH PRESSURES AND MUST BE PROTECTED BY A PROPERLY SIZED AND OPERABLE PRESSURE RELIEF DEVICE PIPED INTO THE DISCHARGE LINE. THIS IS MANDATORY TO PREVENT DAMAGE TO THE PUMP OR CONNECTED EQUIPMENT, OR POSSIBLE INJURY TO PERSONNEL. DO NOT INSTALL ANY VALVES OR SHUTOFF DEVICES BETWEEN THE PUMP, RELIEF VALVE AND THE HR2-20 HAND REGULATOR VALVE.

TYPICAL INSTALLATION





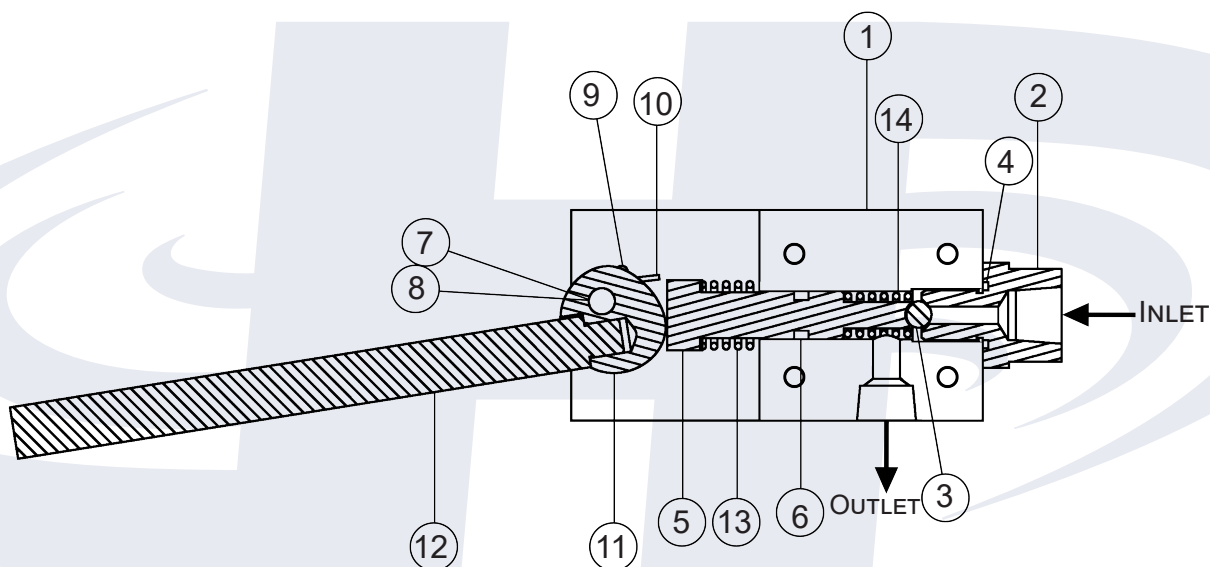
1. Install a properly sized and pressure rated tee in the pump discharge line upstream of any block or check valves (see Typical Installation on pg. 1).
2. Securely mount the HR2-20 hand regulator in a location that will be convenient. Four (4) holes sized for 1/4" bolts are provided in the side of the HR2-20 hand regulator for this purpose.
3. Pipe the branch connection of the tee into the inlet connection of the HR2-20 hand regulator. The piping should be sized to be capable of handling the full amount of the pump flow rating and should be rated for the maximum discharge pressure rating of the system.
4. Pipe from the outlet connection of the HR2-20 hand regulator to a low pressure location, preferably the original source of supply to the pump below the liquid line. It is not recommended that this piping be directly into the pump suction line, but should be back to a high volume location. This piping can be of a lower pressure rating, but not less than 1000 psi working pressure.
5. The opposite end of the branch tee should be piped to the main system, using properly sized and pressure rated piping. If the system will be used for hydrostatic testing, a check valve should be included in this line, with a bleed or dump valve installed downstream of the check valve (see Typical Installation on pg. 1). A pressure gauge should also be installed downstream of the check. Install all high pressure fittings and equipment directed away from areas accessible by personnel to prevent injury in the event of accidental equipment or system failure.
6. Insure that operating personnel are provided with OSHA approved safety wear and gear to prevent injury from high pressure equipment.

B. OPERATION

1. Read all instructions carefully.
2. Inspect safety relief devices.
3. Check tightness of all connections.
4. Open all block valves
5. Start the pump and check for proper operation.
6. While monitoring system pressure gauge, move the arm of the HR2-20 hand regulator. System pressure will rise as the arm is moved. For hydrostatic testing, once the desired pressure is reached the arm can be released. The pump discharge pressure will drop to a minimal level, while the hydrostatic pressure will be maintained by the downstream discharge check valve. Upon completion of testing, open the downstream pressure bleed or dump valve to drop the test pressure back to atmospheric pressure.

II. SERVICE

Should it become impossible to achieve the desired system pressure, it may be necessary to replace the valve ball (item 3) and valve seat (item 2). The inlet seat is the main wear item on the valve and should be available as a spare part with the pump unit. Over time, higher than normal handle pressure to achieve the same test pressure can be an indication that the valve seat will soon need replacing. After being certain that all pressure is released, disconnect the piping from the HR2-20 inlet and unscrew the valve seat (item 2). The valve ball (item 3) and valve seat (item 2) may then be replaced. A new O-ring (item 4) should also be used.



<u>ITEM</u>	<u>DESCRIPTION</u>	<u>QTY</u>	<u>PART No.</u>
1	Valve Body	1	0175R
2	Inlet Valve Seat (HR2-20)	1	0580, Autoclave 9/16" MP*
	(HR2-20HP)	1	0580-HP, Autoclave 9/16" HP*
3	Valve Ball	1	0173B*
4	Valve Seat O-Ring	1	0373*
5	Valve Stem	1	0173R
6	Polypak, Valve Stem	1	0824*
7	Cam Bolt	1	0838
8	Nylon Locknut	1	0839
9	Roller Cam	1	0828
10	Torsion Spring	1	0830
11	Stop Screw	1	0831
12	Handle	1	0829
13	Outer Coil Spring	1	0825
14	Valve Return Spring	1	0375

* Recommended Spare Parts

III. PERFORMANCE

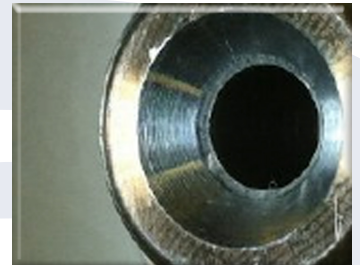
Maximum pressure rating: 20,000 psi for HR2-20
30,000 psi for HR2-20-HP

Nominal flow rating: 10 gpm

CV: 0.43

IV. TIPS

1. Keep a spare seat and ball on hand when in the field. With continued usage there will be wear to the seat as shown here. This causes an increase in the required handle force to achieve the desired pressure. Solids in the fluid stream will accelerate wear at high pressure!
2. Occasionally spray the valve stem and bore with WD40 in humid or salty conditions.



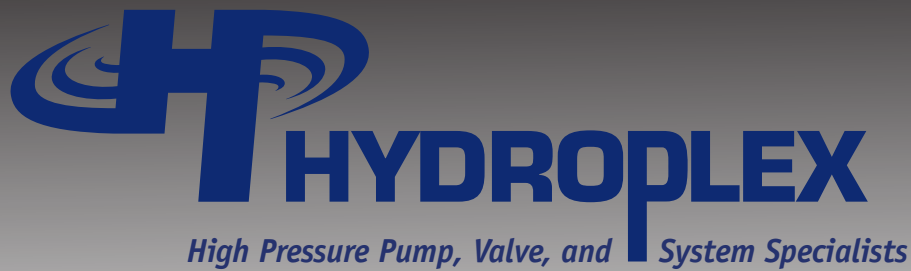
V. WARRANTY

HYDROPLEX CORPORATION warrants new equipment (and its component parts) of its own manufacture and service and repair and replacement parts of its own manufacture against defects in material and workmanship under normal use and service for the following periods:

In the case of new equipment (and its component parts) – for 12 months after the date of installation or start-up, or for 18 months after the date of shipment by HYDROPLEX CORPORATION, whichever occurs first.

- In the case of service parts – for 90 days from the date of delivery.
- In the case of repair or replacement parts for 90 days from shipment or repair or, if longer, for the remainder of the original warranty period applicable to the equipment or part being repaired or replaced.
- The forgoing warranty with respect to repaired or replacement parts applies only to the repaired or replacement part and does not extend to the equipment, or any other of its components, being repaired or replaced.

Buyer must give HYDROPLEX CORPORATION notice in writing on any alleged defect covered by this warranty (together with all identifying details, including the serial number, the type of equipment and the date of purchase) within 30 days of the discovery of such defect during the warranty period. No claim made more than 30 days after the expiration of the warranty period shall be valid. Any cause of action for breach of the foregoing warranty shall be brought within one year from the date the alleged breach



was discovered or should have been discovered, whichever occurs first.

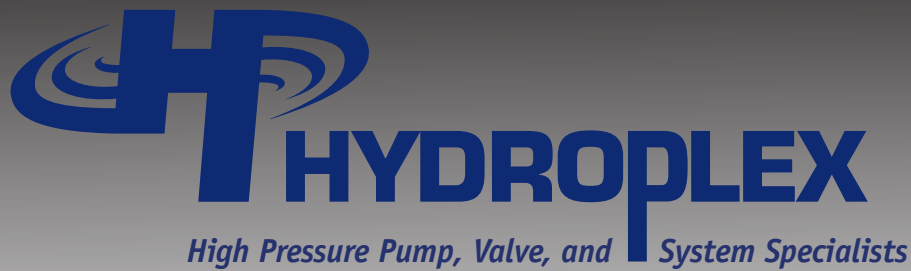
HYDROPLEX CORPORATION does not warrant accessories or components that are not manufactured by HYDROPLEX CORPORATION, however, to the extent permitted by the original manufacturer, HYDROPLEX CORPORATION agrees to assign to Buyer its rights under the original manufacturer's warranty, without resources to HYDROPLEX CORPORATION.

This warranty is the sole warranty of HYDROPLEX CORPORATION and HYDROPLEX CORPORATION hereby expressly disclaims and buyer waives all other warranties expressed, implied in law or implied in fact, including any warranties of merchantability or fitness for a particular purpose. HYDROPLEX CORPORATION sole obligation under this warranty, and buyer's exclusive remedy, shall be, at HYDROPLEX CORPORATION's option, either (1) to, as HYDROPLEX CORPORATION chooses, repair or replace any equipment (or its component parts) or part which has a defect covered by this warranty, or (2) to refund the purchase price of such equipment or part: provided that, buyer, at cost, returns the defective equipment or parts to HYDROPLEX CORPORATION's plant where manufactured and prepays transportation charges for the repaired or replacement item from HYDROPLEX CORPORATION's factory to buyer.

Without limitation, under the terms of this warranty, HYDROPLEX CORPORATION shall not be liable for such items as: (a) equipment conditions caused by normal wear and tear, abnormal conditions or use, accident, neglect, or misuse of equipment; (b) the expense of, and loss or damage caused by, repairs or alterations made by anyone other than Hydroplex Corporation or an authorized Hydroplex repair center; (c) damage caused by abrasive materials, chemicals scale deposits, corrosion, lightning, improper voltage, mishandling, or other similar conditions; (d) any loss, damage or expense relating to or resulting from installation, removal or re-installation of equipment; or (e) any labor costs or charges other than those of HYDROPLEX CORPORATION incurred in repairing or replacing defective equipment or parts, including the cost of reinstalling parts that are repaired or replaced by HYDROPLEX CORPORATION.

Equipment performance is not warranted or guaranteed unless separately agreed to by HYDROPLEX CORPORATION in accordance with its guarantee policy. Performance curves and other information submitted to Buyer are approximate, and no warranty or guarantee shall be deemed to arise as a result of such submittal. All testing shall be done in accordance with HYDROPLEX CORPORATION's standard policy. In the event that, notwithstanding the terms of this warranty, it is determined by a court of competent jurisdiction that an express warranty has been given by HYDROPLEX CORPORATION to the Buyer with respect to the speed, capacity or other like performance characteristics of equipment or parts, HYDROPLEX CORPORATION's liability for breach of the same shall be limited to accepting return of the equipment or parts FOB plant of manufacture, refunding any amounts paid by the Buyer to HYDROPLEX CORPORATION on account of the purchase price (less depreciation charges at the rate of 15% per year if the Buyer has used the equipment or parts for more than thirty days) and canceling any balance still owing on the equipment or parts.

Since the compliance with various Federal State and Local laws and regulations concerning occupational health and safety, the environment, construction or other matters are affected by the use, installation



and operation of the equipment and other matters over which HYDROPLEX CORPORATION has no control, HYDROPLEX CORPORATION assumes no responsibility for compliance with any laws and regulations, whether by way of indemnity, warranty or otherwise. All repairs or services performed by HYDROPLEX CORPORATION, which are not covered by this warranty, will be charged in accordance with HYDROPLEX CORPORATION's standard prices then in effect.

Disclaimer of consequential and incidental damages: HYDROPLEX CORPORATION in no event shall be liable whether in warranty, contract, strict liability in tort or negligence for consequential or incidental damages, including, without limitation, the loss of profits, use, income, crops or production, or increased costs of operation, arising in connection with the sale, installation, use of, inability to use, or the repair or replacement of HYDROPLEX CORPORATION equipment, parts or services.