

INSTRUCTION MANUAL

PORTABLE INTENSIFIER SYSTEM

M-HC225



MINIMUM SIZE – MAXIMUM POWER

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1.1 - Safety Precautions - IMPORTANT -

Although the miniBOOSTER hydraulic intensifier has been designed with operator safety in mind, it still requires the operator to be vigilant upon use.

Therefore, it should be observed that the below mentioned safety instructions are followed. Contact miniBOOSTER or your local miniBOOSTER distributor in case of any doubt.



Read all instructions, warnings and cautions carefully. Follow all safety precautions to avoid personal injury or property damage during system operation. miniBOOSTER cannot be held responsible for damage or injury resulting from unsafe use, lack of maintenance or incorrect product and/or system operation. Contact your miniBOOSTER distributor if in doubt as to the safety precautions and operations.



Eye protection must be worn while unpacking, installing, repairing and initial start-up of this miniBOOSTER product.



Gloves must be worn while unpacking, installing, repairing and initial start-up of this miniBOOSTER product.



The hydraulic system should always be de-pressurised before any couplings are disconnected. Check the integrity of connections before applying any hydraulic pressure.



Do not apply any hydraulic pressure to non-connected fittings.



Do not unscrew any nipples, couplings or fittings being under any hydraulic pressure.



Avoid sharp bends and kinks when routing hydraulic hoses.



Never exceed the maximum working pressure of the hydraulic system.



If the hydraulic system is under pressure **DO NOT STAND IN LINE** with any fittings, connections or other moving parts i.e. piston-rods and/or any other parts mechanically or hydraulically connected to the hydraulic



All hoses, couplings and fittings connected to the hydraulic system, including the miniBOOSTER, must be kept clean and free from debris and contamination at all times. Follow all instructions provided in this manual whenever installing, running and/or repairing the miniBOOSTER.

This instruction does not override any local safety regulations or relevant hazardous, regulations, which must always take precedence.

Never exceed the specified maximum pressure ranges, temperatures and flows.

Never put the component into operation until the machine, into which it is assembled, complies with all relevant directives and regulations in EU and EFTA.

miniBOOSTER® A/S cannot be held responsible for damage or injury resulting from unsafe use of the product, lack of maintenance, or incorrect product and system application.

If you have any doubts about precautions or applications, contact your local distributor, the manufacturer or visit www.minibooster.com

1.2 - Warranty

Never attempt to disassemble the booster or any other component from the system where it is not specifically described to do so. Any attempt will void the warranty if no consulting has taken place with miniBOOSTER.

DECLARATION OF CONFORMITY

We the manufacturer:

miniBOOSTER Hydraulics A/S
Fynsgade 3
DK 6400 Sønderborg
DENMARK

Declare that:

Hydraulic Intensifiers all types, variants and accessories are designed and manufactured in accordance with the below directives.

2006/42/EC Machinery Safety Directive
97/93/EC Pressure Equipment Directive where required (Max HPXVol >10,000)

The manufacturer miniBOOSTER® is ISO 9001 certified by Bureau Veritas (Certificate number DNKFRC10000046A). Each hydraulic intensifier has an identifiable serial number, stamped into its metal body. Year of manufacture and intensification factor are stamped into the metal body too. All technical documentation is drafted in accordance with the term "sound engineering practice" and in accordance with all of the processes and test procedures described in miniBOOSTER®'s process guides. All intensifiers are individually pressure tested prior to the EOL-approval.

1.3 - Serial Number and Identification Plate Location

Each individual pressure intensifier system can be identified by a unique serial number and its type-code which is stamped on the manifold housing.

The type number and the serial number is required when ordering repairs of the miniBOOSTER pressure intensifier systems.



The example specifies :

M-HC225-4.0-B-1	Model
11-20-073	Serial number (week-year-number)

Nomenclature:

M	Manifold system
HC225	Booster model
4.0	Intensification ratio
B	Incl. dump valve
1	H connection = BSPP

1.4 - Materials Certificate

All body parts of the booster are marked with a 3.1 material certificate specification number, which provides materials traceability.

A material certificate verifies the origin batch numbers, the compositions and the test results of the materials used for the individual body parts. It is possible to order the certificates on request.

1.5 - Technical Specification



Never exceed the below pressure, flow and temperature ranges, as this will damage the internal seals of the intensifier.

Model (Example)

M-HC225

Weight

5.7 kg / 11.0 lbs.

Pressure Ranges:

Inlet

P, T and Z

0 - 207 bar / 3,000 psi

Outlet

H

0 - 800 bar / 11,600 psi

Flow Ranges:

0 - 40 l/min / 10.6 US gpm

Media:

Recognized hydraulic fluids

Threaded Connections:

P, T and Z

Metallic tube connections

M14 x 1,5 - 24° Cone (ISO 8434-1)

H

1/4" BSPP male (ED-seal)

Temperature Ranges:

-40°C to 100°C / -40°F to 212°F

Materials of Construction:

Housing

Stainless steel

Booster

Cast iron

Booster manifold

Aluminium

Valves

Alloy steel

Static seals standard

Nitrile NBR

Filtration Recommendations:

		0-140 BAR (0-2,030 psi)		141-207 BAR (2,031-3,000 psi)		> 207 BAR (> 3,000 psi)	
Media		ISO 4406 Scale number	Micron rating	ISO 4406 Scale number	Micron ratings	ISO 4406 Scale number	Micron ratings
Oil	>5cSt	19/17/14	10	18/16/13	5	17/15/12	3



Medias not filtered in accordance with the recommendations given in this chapter may be the reason to severe damage of the pressure intensifier system.

2.1 - Product Description

The M-HC225 portable pressure intensifier system is designed to increase the pump pressure up to 800 bar / 11,600 psi. The pressure is boosted from the “P” connection of the system to the “H” connection. Oil supplied to the “T” connection flows directly to the “Z” connection without any pressure intensification.

Inlet Pressure Adjustment

(Pressure reducing valve #5)

The M-HC225 incorporates a Pressure Reducing valve, which enables the user to make fine adjustment of the output pressure.

Automatic Pressure Intensification

(Counterbalance Valve #13)

The M-HC225 is a compact field unit weighing only 5.7 kg. It is ideal for use in a variety of applications where building and maintaining high pressure is required.

The M-HC225 incorporates a counterbalance valve, which allows fast-forward movement of a cylinder by directing the full inlet flow to pass directly through the booster section until the set pressure has been reached. Then the counterbalance valve opens, and the booster starts oscillating.

The M-HC225 booster will automatically stall when the high-pressure side H is reached. The booster will continuously compensate for oil consumption to maintain the high pressure. Adjustment of the outlet pressure is carried out by varying the supplied pressure.

An optional orifice can be mounted in the booster to reduce inlet flow to the maximum allowed for the intensification ratio selected.

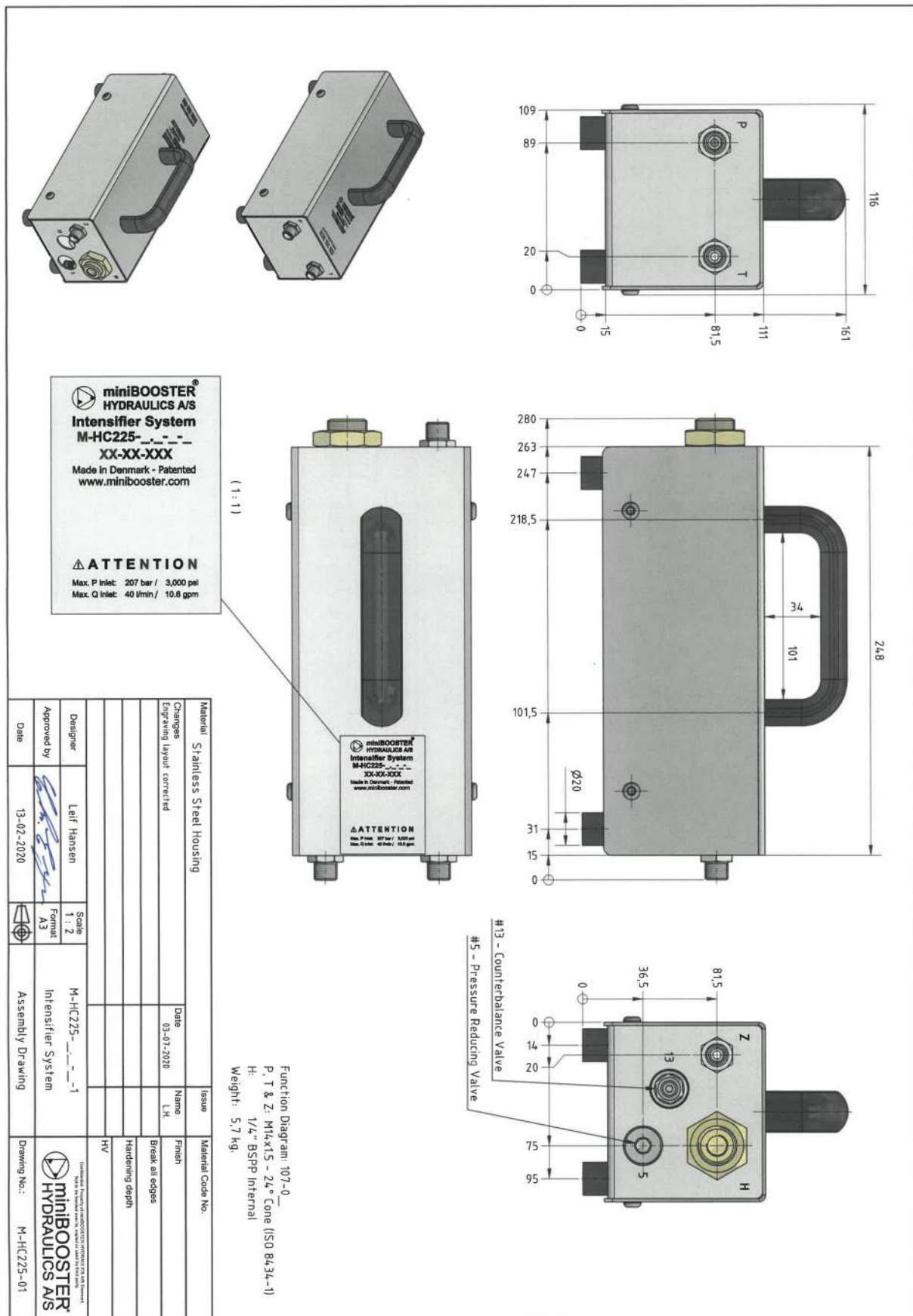
The set point of the Counterbalance Valve is adjustable from 27 – 77 bar / 390 – 1,116 psi. (pump pressure)

Key features of the pressure intensifier system:

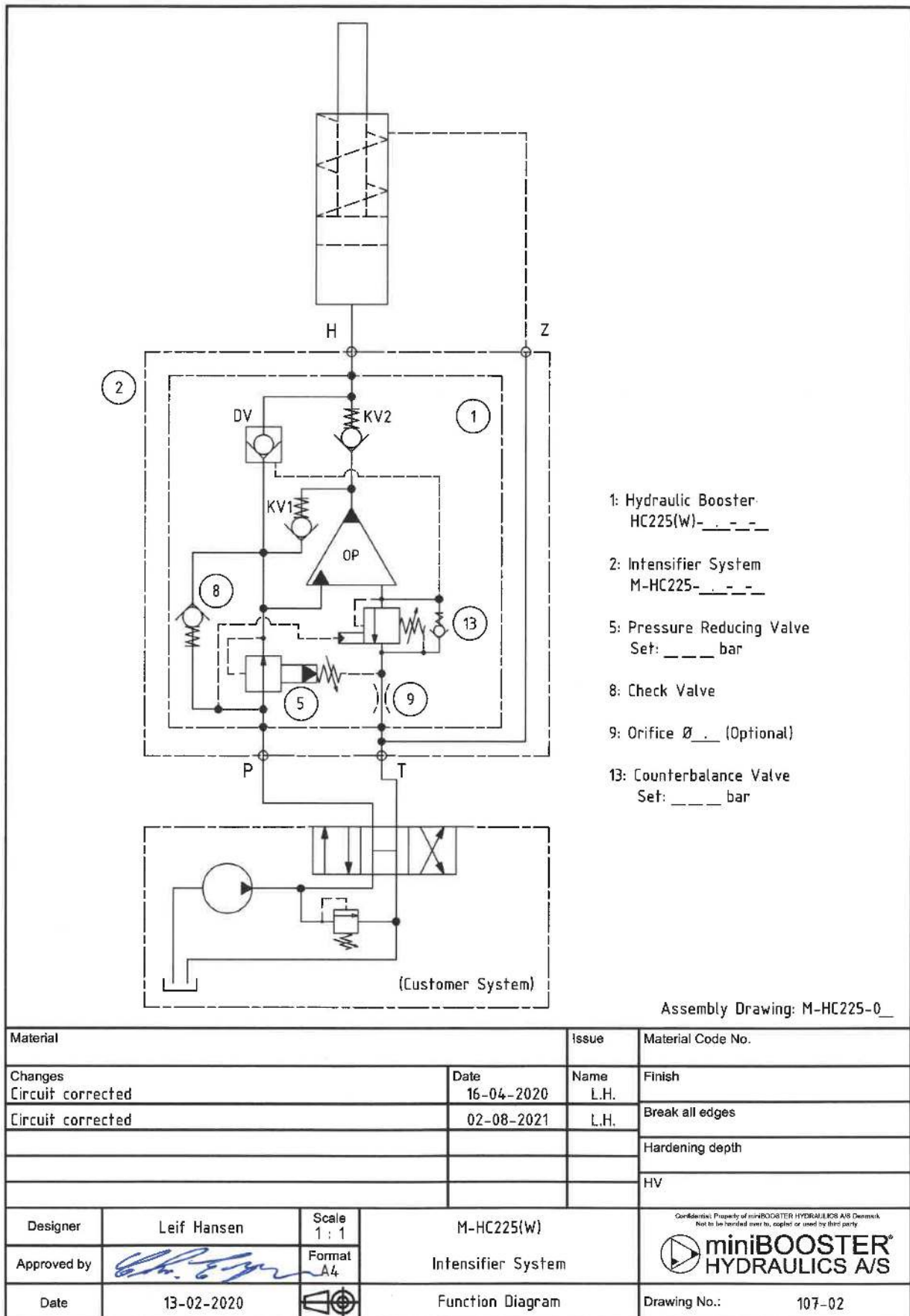
- ▶ Adjustable Counterbalance Valve to automatically boost pressure and take full advantage of the available pump flow.
- ▶ Adjustable inlet pressure setting to protects both booster and high-pressure tool.

Intensification factor <i>i</i>	Max. flow IN		Max. flow H		Max. pressure IN		Max. pressure H	
	l/min	gal/min	l/min	gal/min	bar	psi	bar	psi
1.2	8	2.1	3.5	0.9	207	3,000	248	3,600
1.5	12	3.2	4.2	1.1	207	3,000	311	4,500
2.0	12	3.2	3.2	0.8	207	3,000	414	6,000
2.2	12	3.2	2.9	0.8	207	3,000	455	6,600
2.5	13	3.4	2.7	0.7	207	3,000	518	7,500
2.8	13	3.4	2.5	0.7	207	3,000	580	8,400
3.2	15	4.0	2.5	0.7	207	3,000	662	9,600
4.0	14	3.7	2.0	0.5	200	2,900	800	11,600
5.0	14	3.7	1.6	0.4	160	2,321	800	11,600
6.6	13	3.4	1.3	0.3	121	1,758	800	11,600
9.0	13	3.4	0.9	0.2	89	1,289	800	11,600
13.0	12	3.2	0.6	0.2	62	893	800	11,600
20.3	12	3.2	0.3	0.1	40	580	800	11,600

2.2 - Assembly Drawing



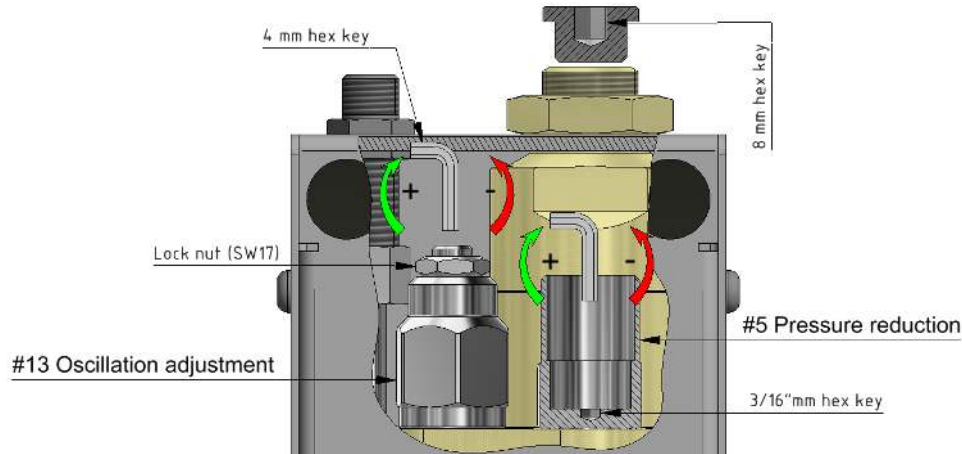
2.3 - Function Diagram



3.1 - Introduction

The Counterbalance Valve and the Pressure Reducing Valve are adjusted from factory to the settings required by the customer. If needed, section 3.2 and 3.3 provides guidance for any needed re-adjustment. The Counterbalance Valve is adjustable from 27 – 77 bar / 390 – 1,116 psi. (pump pressure)

In case that the valve malfunctions or wears out, the sections will also explain how to replace it.



3.2 - Booster Inlet Pressure Control (Pressure Reducing Valve #5)

Tools:

8 mm hex key

3/16" hex key

26 mm torque wrench (*only required for replacing the valve*).

CW = Clockwise direction

CCW = Counter Clockwise direction

3.2.1

Loosen the closure plug from the top of the valve (CCW) by using the 8 mm hex key.

3.2.2

Use the 3/16" hex key to rotate the internal screw and adjust the pressure setting. (explanation in section 2.1).

CW = Increase pressure setting.

CCW = Decrease pressure setting.

3.2.3

Retighten the nut. Use the hex key to prevent the stem from rotating.

Replacement

Use the 26 mm wrench to unscrew the valve (CCW). Before installing the new valve, check that the cavity is free from any remains of O-rings and other particles. Recommended installation torque is 73 Nm / 54 lbf-ft.

3.3 - Fast-forward movement control (Counterbalance Valve #13)

Tools:

4 mm or 3/16" hex key.

17 mm or 11/16" spanner or adjustable wrench.

27 mm or 1-1/16" torque wrench (*only required for replacing the valve*).

CW = Clockwise direction

CCW = Counter Clockwise direction

3.2.1

Loosen the nut from the stem of the valve (pos. 13) using the 17 mm Spanner (CCW).

3.2.2

Use the 4 mm hex key to rotate the stem and adjust the backpressure setting. (explanation on page 6).

CCW = Increase setting for booster operating.

CW = Decrease setting for booster operating.

3.2.3

Retighten the nut. Use the 4 mm hex key to prevent the stem from rotating. The recommended torque is 16 - 20 Nm / 12-15 lbf.ft.

Replacement

Use the 27 mm wrench to unscrew the valve (CCW). Before installing the new valve, check that the cavity is free from any remains of O-rings and other particles. The recommended installation torque is 45-50 Nm / 33-37 lbf.ft.

3.4 - Adjustment from Scratch

Preliminary steps:

- Stop the pump.
- Decrease the pressure reducing valve set pressure as much as possible (CCW).
- Decrease the counterbalance valve set pressure as much as possible (CW).

3.4.1

Turn on the pump and increase the pump pressure to the desired operating pressure.

3.4.2

Slowly increase the pressure reducing valve setting to desired booster inlet pressure.

The pressure reducing valve setting is now ok.

3.4.3

Turn on the pump and increase the pump pressure to the desired counterbalance setpoint.

3.4.4

Slowly increase the counterbalance valve set pressure until the booster starts to oscillate (CCW). Use your hand and hearing to sense the oscillation.

The counterbalance setting is now ok.

4.1 - General Use

All new or repaired intensifiers from miniBOOSTER have been hydraulically tested under full load conditions after assembly and are guaranteed full functionality and efficiency.

The pressure intensifier systems has been designed and manufactured to provide reliable service over a range of demanding applications. The intensifier does not require special maintenance, but should be kept free from dust, dirt and debris.

A visual inspection for oil escaping on any exterior part of the pressure intensifier system should be conducted on a regular basis.

4.2 - Installation

The pressure intensifier system could be installed in any position (vertical, horizontal, angled etc.) Use the four provided screws to firmly secure the system.



Either way the pressure intensifier system is installed, it is important that the system is initially started-up in accordance to the below mentioned instructions. Incorrect initial start-up of the intensifier may cause severe damages to the internal components of the intensifier.

4.3 - Bleeding and Initial Start-Up

At the initial start-up the intensifier should be operated gently at a max LP-IN pressure of approximately 100 bar (1,450 psi) for 1 to 2 minutes, as to ensure it is properly bled from trapped air. Hereafter the pressure intensifier system could be operated at its full capacity.



IMPORTANT! At no time should the intensifier be operated beyond the specifications listed in Section 1.5

4.4 - Repair

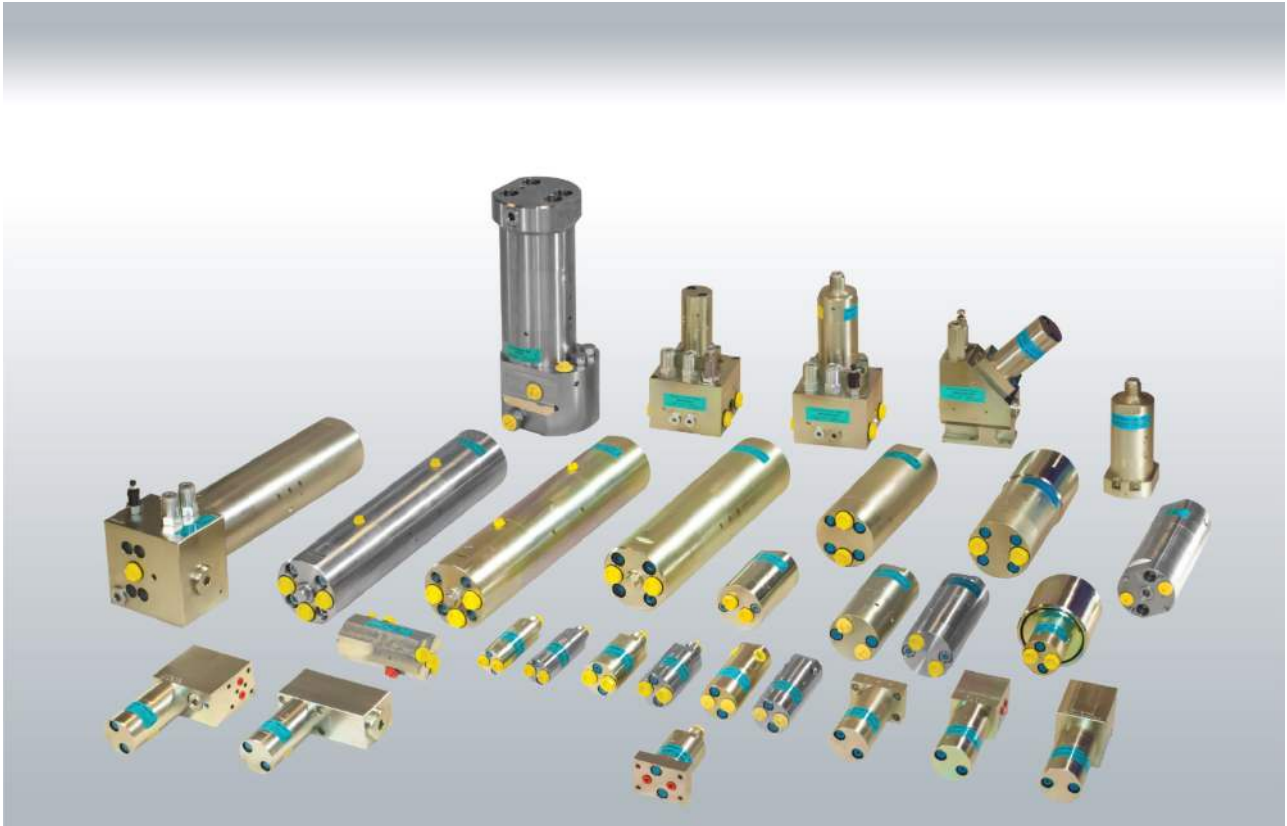
In case the intensifier should malfunction, all repairs of the product should be conducted by miniBOOSTER only i.e. since any intervention on the intensifier requires special tools and special testing equipment.

Before the pressure intensifier system is disconnected and sent for repair, it should be thoroughly cleaned at the exterior. Once the pressure intensifier system has been disconnected all connection bores should immediately be plugged efficiently with plugs or tape, before the intensifier is sent to miniBOOSTER or to the miniBOOSTER distributor, i.e. since an internal contamination of the intensifier may obstruct the fault-finding process at the miniBOOSTER service department.

5.1 - Troubleshooting

Symptom	Possible causes	Remedy
Booster does not oscillate when the cylinder has been filled.	Counterbalance valve setting is too high.	Adjust the counterbalance valve setting.
Booster does not reach high pressure.	Pressure reducing valve setting is too low.	Adjust the inlet pressure control valve setting (section 3.2).
Other symptoms		Consult miniBOOSTER

The only full range of hydraulic intensifying solutions



Authorised distributor: