INSTRUCTION MANUAL

FUEL VALVE TEST DEVICE

MODEL : HDFD-1100

HANMI POWER

ISO 9001

HDFD-1100

FUEL VALVE TEST DEVICE

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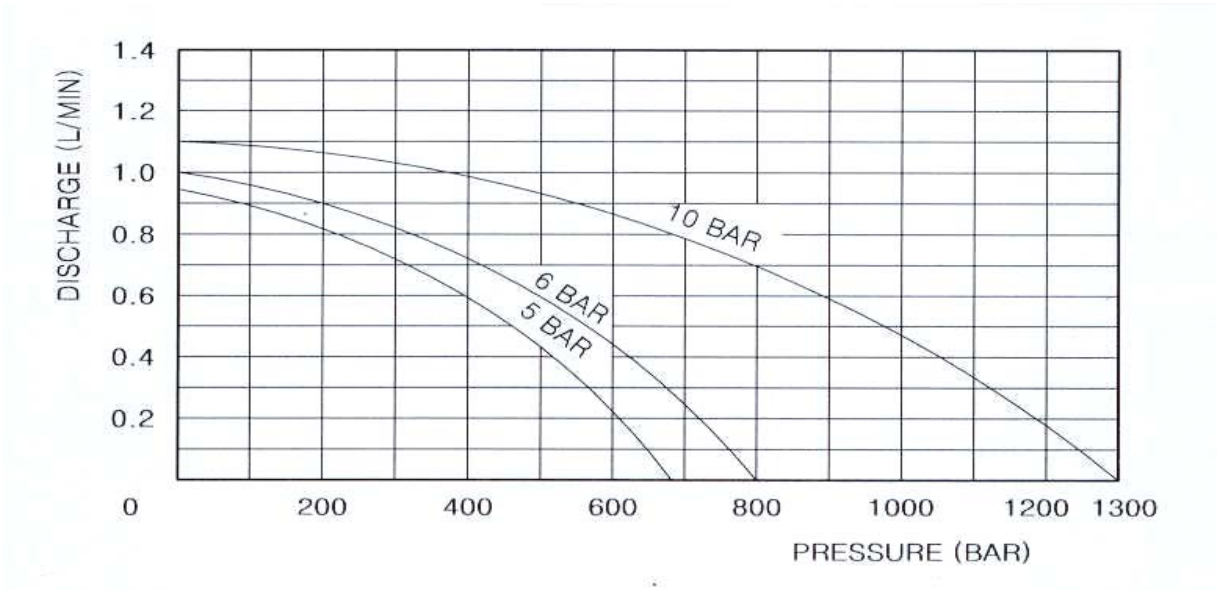
- TOOLS (DWG NO. M12-7112-0.1)
- SPARE PARTS (DWG NO. 1M12-7113-0.0)

A. SPECIFICATIONS

1. MODEL NO	:	HDFD-1100
2. OUTPUT PRESSURE	:	0~1300BAR AT 10BAR AIR INPUT 0~900BAR AT 7BAR AIR INPUT
3. AIR CONSUMPTION	:	60.5LITERS/CYCLE AT 10BAR INPUT 44LITERS/CYCLE AT 7BAR INPUT
4. MAX. FLOW AT NO PRESSURE	:	APPROX. 1.2LITERS/MIN AT 7BAR AIR INPUT
5. DISPLACEMENT PER CYCLE	:	17.2㎤
6. PUMP SPEED	:	APPROX. 60 CYCLES/MIN. AT 7BAR AIR INPUT
7. OIL TANK CAPACITY	:	6 LITERS
8. WEIGHT	:	ABT. 115kg AT EMPTY
9. DIMENSION	:	885mm X 638mm X 1700mm
10. POWER SUPPLY	:	SINGLE PHASE 115~230VAC
11. CLASSIFICATION	:	GAUGE-CLASS 1.0, DISPLAY 0.2

PERFORMANCE CURVES



B. OPERATION INSTRUCTIONS

The HDFD-1100 ensures the correct testing of MAN B&W Diesel slide fuel valve.

The atomizing test cannot be executed.

The below procedure for fuel-valve testing is to be in compliance with the MAN B&W Diesel A/S guidelines for testing of fuel injection valves. Please refer to the MAN B&W manual for general fuel valve maintenance. All numbers in the text refer to the numbers found on the HDFD-1100 front panel (see the figure 1, Unit Layout illustrated overleaf.)

Pre-testing preparations :

Before performing any of the tests, the slide-valve must be completely filled with test-oil :

- Turn Switch ⑤ to position **RESET**
- Close Pressure Release Valve ② by turning clockwise
- Turn Pressure Control Valve ③ clockwise, until the **WORKING PRESSURE** Display ⑧ shows a pressure above zero
- The valve is now filled with oil. When clear oil without air-bubbles tickles from the venting hole through the breathing-pipe, the valve is full
- Turn Pressure Control Valve ③ counter-clockwise to switch off air supply
- Open Pressure Release Valve ② by turning counter-clockwise

Test A : Venting function

Before performing any of the tests, the slide-valve must be completely filled with test-oil, as described in the section "Pre-testing preparations".

- Turn Switch ⑤ to position **RESET** position
- Close Pressure Release Valve ②
- Slowly adjust Pressure Control Valve ③ until WORKING PRESSURE ⑧ is around 200bar
- Turn Switch ⑤ to **VENTING PRESSURE** position
- Turn Pressure Control Valve ③ quickly counter-clockwise to switch off air supply
- The pressure will slowly decrease on the **WORKING PRESSURE** Display ⑧. When the internal leak slide valve opens, the opening pressure is shown on **OPENING + VENTING PRESSURE** Display ⑦. The pump stops automatically
- Open Pressure Release Valve ② - turn it counter-clockwise

(Figure 1, Unit Layout)

① Full Stroke Push Button
② Pressure Release Valve
③ Pressure Control Valve
⑤ Switch (OFF / VENTING / RESET / OPENING)
⑥ Air Pressure Gauge (0~10bar)
⑦ Pressure Display (VENTING + OPENING PRESSURE)
⑧ Pressure Display (WORKING PRESSURE)

Test B : Opening pressure | **The atomizing test cannot be executed.**

- Turn Switch ⑤ to **RESET** position.
- Close Pressure Release Valve ②
- Slowly adjust Pressure Control Valve ③ until **WORKING PRESSURE** ⑧ is around 200bar
- Press **FULL STROKE** Push Button ①
- Turn Switch ⑤ to **OPENING PRESSURE** position
- Increase pressure using Pressure Control Valve ③ until opening pressure is reached
- The opening pressure is shown on the **OPENING + VENTING PRESSURE** Display ⑦ the pump stops automatically
- Close Pressure Control Valve ③ - turn it counter-clockwise
- Open Pressure Release Valve ② - turn it counter-clockwise

Test C : Leak Test

- Turn Switch ⑤ to **RESET** position
- Close Pressure Release Valve ②
- Slowly adjust Pressure Control Valve ③ until **WORKING PRESSURE** ⑧ is around 200bar
- Press **FULL STROKE** Push Button ①
- Turn Switch ⑤ to **OPENING PRESSURE** position
- Slowly Adjust pressure using Pressure Control Valve ③ until displayed **WORKING PRESSURE** ⑧ is 10-20bar below the opening pressure measured in Test B
- Close Pressure Control Valve ③ - turn it counter-clockwise
- Open Pressure Release Valve ② - turn it counter-clockwise

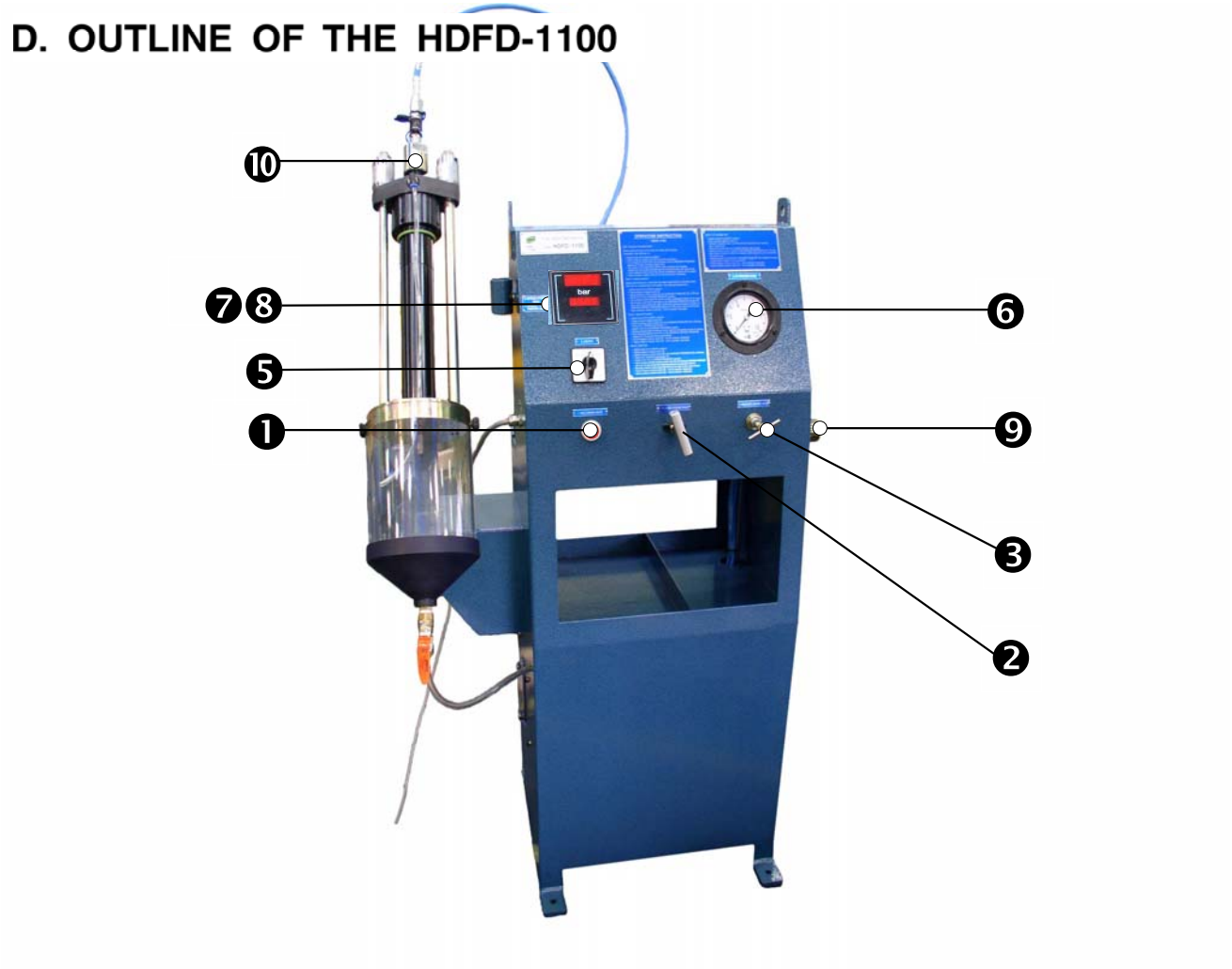
Test D : O-ring Seal Test

- Turn Switch ⑤ to **RESET** position
- Close Pressure Release Valve ②
- Dismantle breathing pipe from the venting hole in the fuel-injection valve head/fixture
- Plug venting hole with plug supplied with the valve holder
- Slowly adjust Pressure Control Valve ③ until **WORKING PRESSURE** ⑧ is around 100bar
- Decrease air pressure using Pressure Control Valve ③ until manometer ⑥ reads 0bar
- Read pressure from **WORKING PRESSURE** Display ⑧. The displayed pressure should remain stable for a few minutes
- Close Pressure Control Valve ③ - turn it counter-clockwise
- Open Pressure Release Valve ② - turn it counter-clockwise

C. TROUBLE-SHOOTING FOR THE HDFD-1100 TEST RIG

Problem	Possible solution	Explanation	Remark
No tests can be preformed Inlet pressure reads 0bar at all times (air pressure gauge ⑥ although air supply is working	Switch ⑤ to position "RESET" and try again	When the electronic blocking system in the HDFD-1100 is activated, air supply to the unit is blocked. The magnet valve is"released" by resetting the unit.	
Air supply is turned off almost immediately after test is started	Make sure that the valve is filled with oil (clear oil is tickling from venting hole when Pressure Control Valve ③ is turned a few times(clockwise) before attempting to run a test. Follow instruction above test A before attempting to run the desired test again	Air inside the fuel valve results in malfunction of the electronic pressure transmitter.	
Air supply is turned off when Full Stroke Button is pressured	Reset the unit, and start the test again. press the "FULL STROKE" Button ① while the Switch ⑤ is in RESET position		
The HDFD-1100 is plugged in and turned on, but air supply is never blocked	1.Make sure the Switch⑤ is pointing at either " OPENING PRESSURE"or"VENTING FUNCTION" 2.If the Switch is pointing at either "OPENING PRESSURE"or"VENTING FUNCTION",and a sudden pressure drop doesn't result in a blocking of the air inlet, the unit needs further trouble-shooting		Consult with Maker HANMI for maintenance advice.
The display on the HDFD-1100 box is not working	Check power supply		

D. OUTLINE OF THE HDFD-1100



Pos. 1	Full Stroke Valve (Push Button)	(HM-FD01-01)
Pos. 2	Pressure Release Valve	(HM-FD04-02)
Pos. 3	Pressure Control Valve / pneumatic reducing valve	(HM-FD04-03)
Pos. 4	Pressure transducer (inside HDFD unit)	(HM-FD04-04)
Pos. 5	Switch (OFF/VENTING PRESSURE/RESET/OPENING PRESSURE)	(HM-FD04-05)
Pos. 6	Air Pressure Gauge for "Inlet air pressure"(0~10bar)	(HM-FD04-06)
Pos. 7+8	Pressure Display with two displays	(HM-FD04-07)
Pos. 9	Adapter "air inlet"M42x2	
Pos. 10	High Pressure Outlet "fuel outlet"	(HM-FD04-10)
Pos. 11	Filler cap with strainer (inside HDFD unit)	(HM-FD04-11)
Pos. 12	Oil filter (inside oil tank)	(HM-FD04-12)
Pos. 13	2-Way pneumatic valve(inside HDFD unit)	(HM-FD04-13)
Pos. 14	Pump AHP-1100(inside HDFD unit)	(12-1100-0.0)

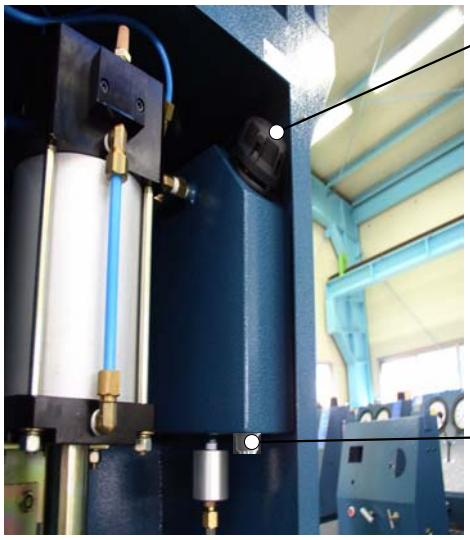
E. OIL CHART

1. Recommendable Oil for Testing
   Rust-preventing hydraulic oil with viscosity of 7-10 cST at 50℃

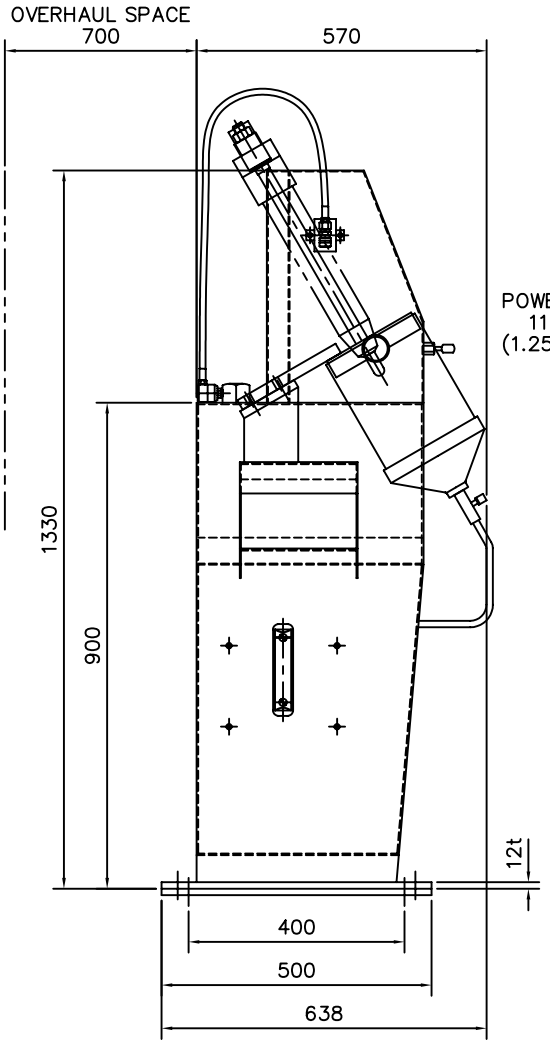
2. Initial Filling Quantity
   Fill the oil until the level gauge indicates between High and Low.
   No further replenishment of the oil is required thanks to the close circuit.
   (see figure 2, Oil level gauge)

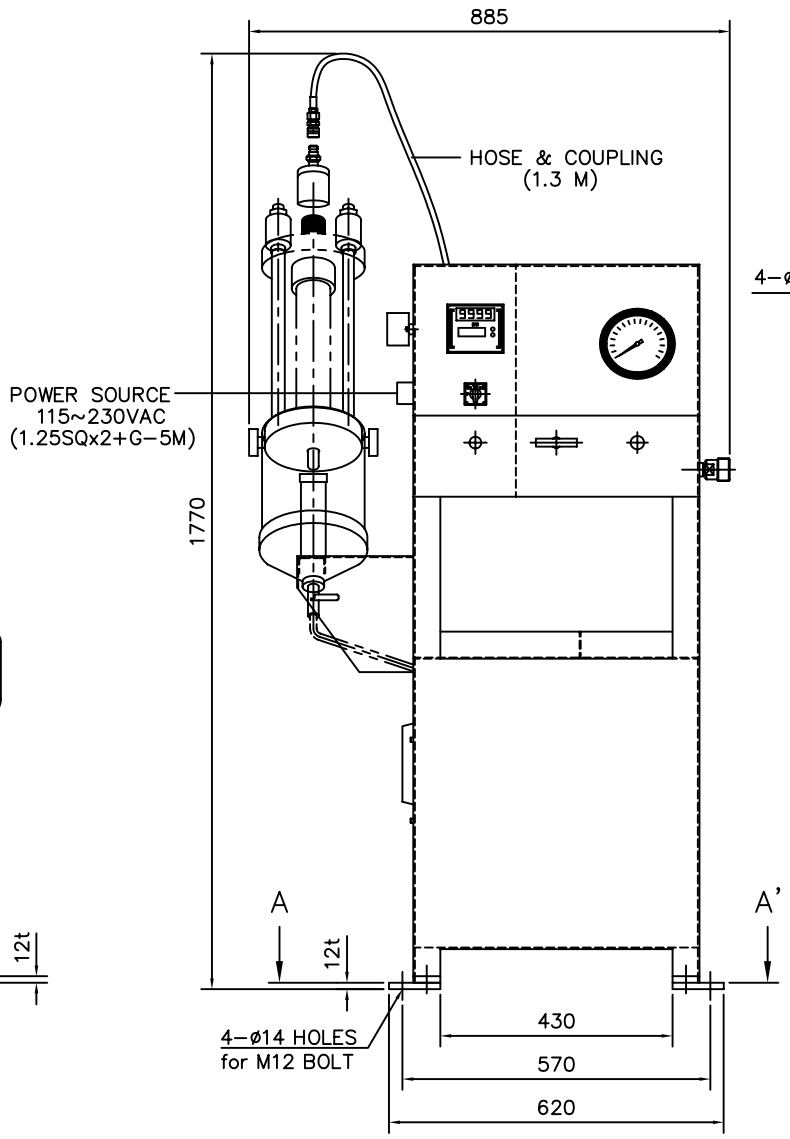
3. Draining oil
   (see figure 3, Oil tank)

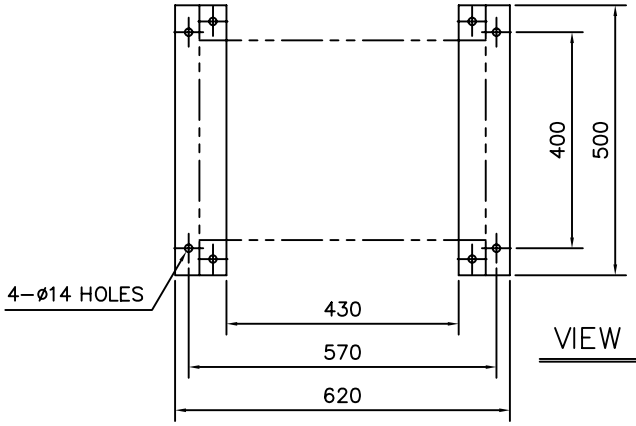
(figure 2, Oil level gauge)



(figure 3, Oil tank)

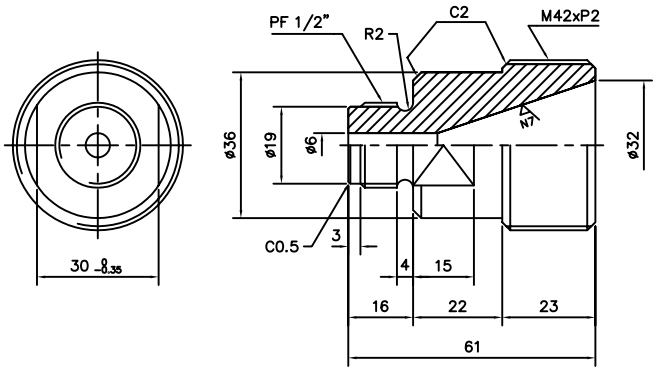






AIR INLET COUPLING

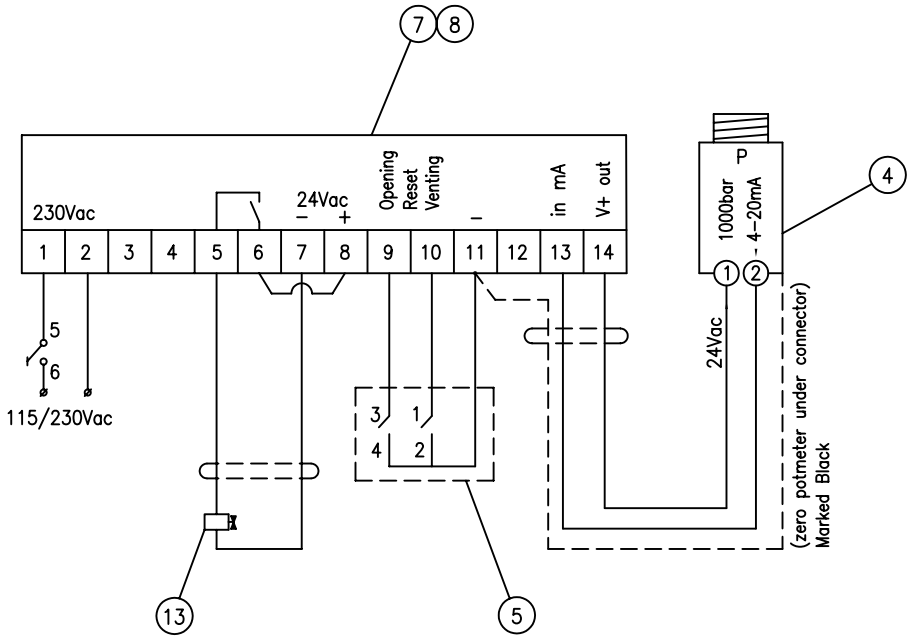
AIR : MIN. 5 BAR
MAX. 10 BAR

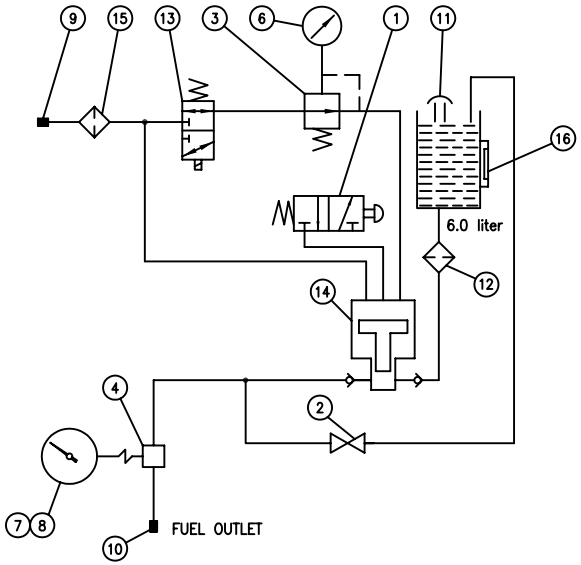


DETAIL OF AIR INLET COUPLING

REV.	DATE	REASON FOR MODIFICATION	REV'D	CHK'D	APP'D
2	050217	Revision of controller	D.H.KOO	B.C.KIM	M.W.CHOI
1	040920	Addition of mounting plate.	D.H.KOO	D.H.KOO	M.W.CHOI

APPROVED M.W.CHOI	SCALE 1 / 10	PROJECT FUEL VALVE TEST DEVICE (HDFD-1100)	PROJECTION
CHECKED D.H.KOO	DATE 040920	TITLE GENERAL ASSEMBLY	
DESIGNED S.Y.CHOI	HANMI HYDRAULIC MACHINERY CO., LTD.		DRAWING NO. M12-7100-0.2





1. FULL STROKE VALVE — HM-FD04-01
2. PRESSURE RELEASE VALVE — HM-FD04-02
3. PRESSURE CONTROL VALVE — HM-FD04-03
4. PRESSURE TRANSDUCER (INSIDE HDFD UNIT) — HM-FD04-04
5. TURN SWITCH (VENTING PRESSURE/RESET/OPENING PRESSURE) — HM-FD04-05
6. AIR PRESSURE GAUGE (0~10bar) — HM-FD04-06
7+8. PROGRAMMABLE DISPLAY — HM-FD04-07
9. AIR INLET WITH ADAPTER (M42x2P)
10. HIGH PRESSURE OUTLET — HM-FD04-10
11. FILLER CAP WITH STRAINER (INSIDE HDFD UNIT) — HM-FD04-11
12. OIL FILTER (INSIDE OIL TANK) — HM-FD04-12
13. 2-WAY PNEUMATIC VALVE — HM-FD04-13
14. PUMP AHP-1100 (INSIDE HDFD UNIT) — 12-1100-0.0
15. AUTO DRAIN FILTER (INSIDE HDFD UNIT) — HM-FD04-15
16. OIL LEVEL GAUGE — HM-FD04-16

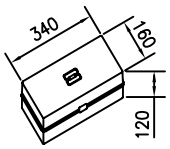
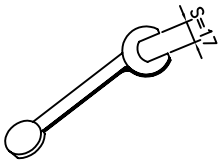
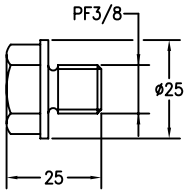
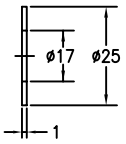
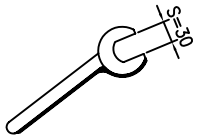
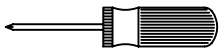
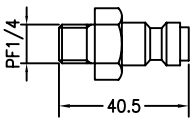
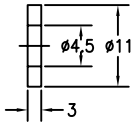
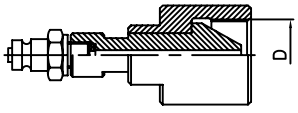
REV.	DATE	REASON FOR MODIFICATION	REV'D	CHK'D	APP'D
2	050218	Revision of controller.	D.H.KOO	B.C.KIM	M.W.CHOI
1	050201	Revision of power source.	D.H.KOO	B.C.KIM	M.W.CHOI

APPROVED M.W.CHOI	SCALE N / S	PROJECT FUEL VALVE TEST DEVICE (HDFD-1100)	PROJECTION
CHECKED D.H.KOO	DATE 04.9.20	TITLE CIRCUIT DRAGRAM	
DESIGNED S.Y.CHOI	HANMI HYDRAULIC MACHINERY CO., LTD.		DRAWING NO. M12-7100-1.2

FUEL VALVE TEST DEVICE

TYPE : HDFD-1100

DWG. NO. : M12-7112-0.1

NO.	NAME	SKETCH	MATERIAL	SUPPLY PER SHIP STAND-ARD	SUPPLY PER SHIP ADDIT-ION	SUPPLY PER SHIP TOTAL	REMARK
1	BOX		PLASTIC	1	–	1	
1-1	COMBINATION SPANNER		TOOL STEEL	1	–	1	
1-2	HEXAGON HEAD PLUG WITH FLANGE AND GASKET		STEEL	1	–	1	
				1	–	1	
1-3	SINGLE OPEN ENDED SPANNER		TOOL STEEL	1	–	1	
1-4	+ DRIVER		–	1	–	1	
1-5	MALE COUPLER		STEEL	1	–	1	
1-6	DISC		COPPER	6	–	6	
1-20	SPRING HOUSING		STEEL	1	–	1	

DIM. (D)	ENG.
M24x1.5	34MC, 42MC
M36x2	46MC-C, 50MC, 50MC-C
M42x2	60MC, 60MC-C, 70MC, K80MC-C K90MC-C,K98MC/-C, K98ME
M48x3	S80MC, S80MC-C S90MC-C, S90ME

MANUFACTURER'S NAME

HANMI HYDRAULIC MACHINERY CO., LTD.

SPARE

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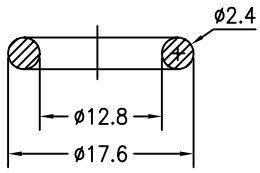
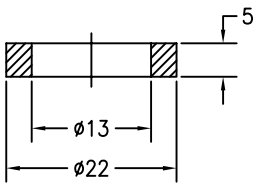
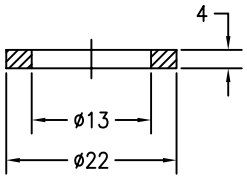
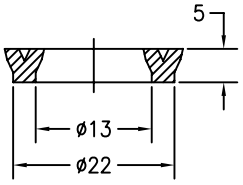
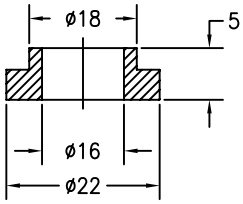
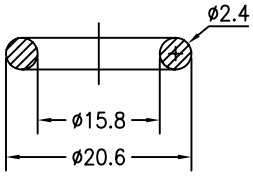
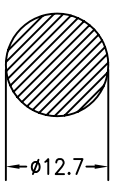
FUEL VALVE TEST DEVICE

TYPE : HDFD-1100

DWG. NO. : M12-7113-0.0 (1/2)

NO.	NAME	SKETCH	MATERIAL	SUPPLY PER SHIP			OLD DWG NO.	NEW DWG NO.	REMARK
				STAND-ARD	ADDIT-ION	TOTAL			
1-7	O-RING		N.B.R	1	-	1	AP1100 -09	12-1109-0	
1-8	SPACER		BC3	1	-	1	AP1100 -11	12-1111-0	
1-9	BACK-UP RING		TEFLON	1	-	1	AP1100 -12	12-1112-0	
1-10	PACKING SEAL		URETANE	1	-	1	AP1100 -13	12-1113-0	
1-11	SUPPORT RING		BC3	1	-	1	AP1100 -14	12-1114-0	
1-12	O-RING		N.B.R	2	-	2	AP1100 -19	12-1119-0	
1-13	BALL		STEEL	2	-	2	AP1100 -21	12-1121-0	

MANUFACTURER'S NAME

HANMI HYDRAULIC MACHINERY CO., LTD.

SPARE

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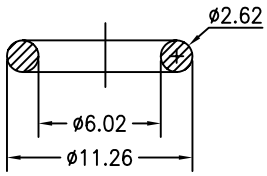
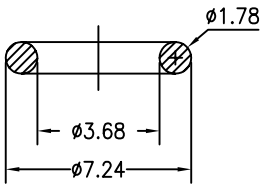
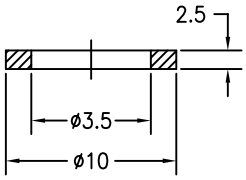
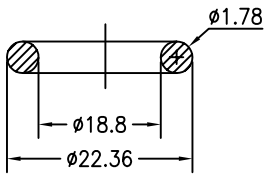
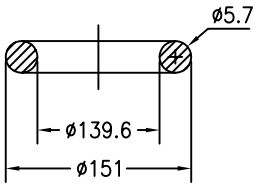
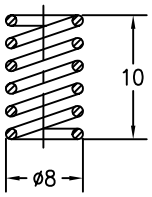
FUEL VALVE TEST DEVICE

TYPE : HDFD-1100

DWG. NO. : M12-7113-0.0 (2/2)

NO.	NAME	SKETCH	MATERIAL	SUPPLY PER SHIP			OLD DWG NO.	NEW DWG NO.	REMARK
				STAND-ARD	ADDIT-ION	TOTAL			
1-14	O-RING		N.B.R	2	-	2	AP1100 -31	12-1131-0	
1-15	O-RING		N.B.R	2	-	2	AP1100 -32	12-1132-0	
1-16	WASHER		Bc3	2	-	2	AP1100 -33	12-1133-0	
1-17	O-RING		N.B.R	8	-	8	AP1100 -45	12-1145-0	
1-18	O-RING		N.B.R	1	-	1	AP1100 -48	12-1148-0	
1-19	SPRING		SUP10	2	-	2	AP1100 -64	12-1164-0	

MANUFACTURER'S NAME

HANMI HYDRAULIC MACHINERY CO., LTD.