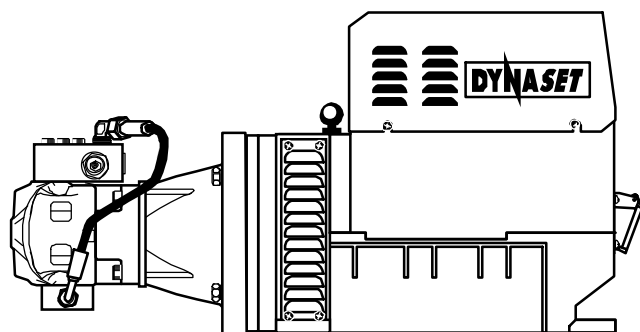
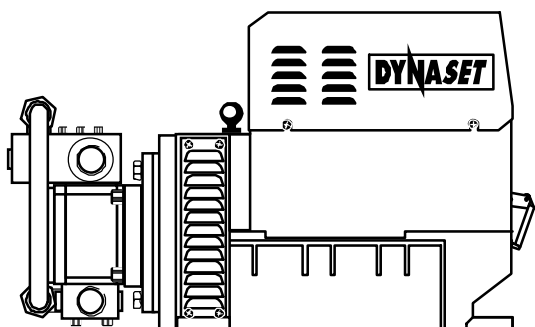


# HWG

## HYDRAULIC WELDERS

### K-SERIES / 3-PHASE AC ELECTRICITY



# OPERATION INSTRUCTIONS

HWG 180/6k - 33	
HWG 220/6k - 48	
HWG 300/8k - 68	
HWG 400/10k - 81	

## GENERAL NOTES

DYNASET hydraulic generators are compact and integrated all-in-one units, especially designed for mobile installation. The only power source is a hydraulic system to provide generator with required hydraulic fluid flow at demanded pressure.

DYNASET hydraulic welding generator transforms hydraulic power into a high quality electricity, which is to be used either for welding or for energising electrical tools, appliances and other equipment.

## CONSTRUCTION

DYNASET hydraulic generator is comprised by hydraulic motor and alternator. The power to weight ratio of DYNASET hydraulic generator is excellent due to modern mono-bearing construction when the other end of rotor's shaft is supported by hydraulic motor.

Unit's rotor, clutched to the hydraulic motor's shaft, is provided with an excitation windings.

In alternator mode (GEN) electric power is taken from stator windings. Auxiliary winding of voltage control system is located in generator's stator as well.

In welder mode electric power is taken from separate welding windings, also placed in the stator.

Windings are isolated from unit's body and their insulation class is H.

The unit has an automatic frequency control valve with ports for pressure and return lines.

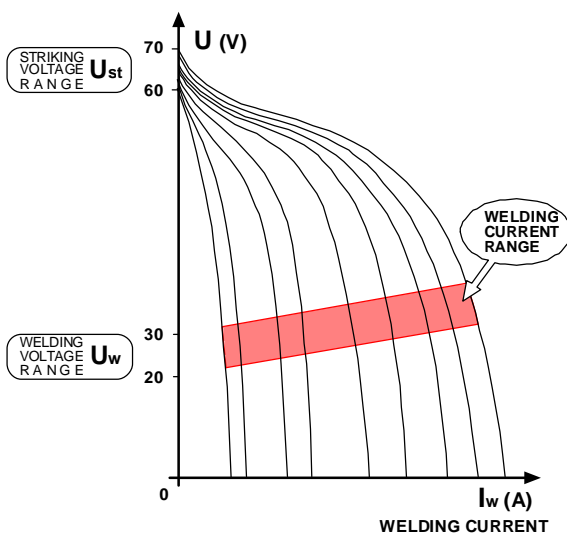
Protection class of standard DYNASET hydraulic welding generators complies with specifications IP 23. Units with other protection class are available by request.

A welder is equipped with standard electric sockets; special sockets are available requested.

Automatic circuit breakers protect unit from overload.

DYNASET hydraulic generators are self-excited. The AC electric load can be connected prior to starting a generator (see chapter OPERATION - ALTERNATOR MODE).

DYNASET hydraulic generator is assembled in lightweight aluminium alloy molded case with footing for fixing.



## WELDING CONTROL

Welding performance is optimised by automatic excitation power regulator (EPR), which operates concurrently with welding impedance and auxiliary windings of the unit (ref. to electric diagram of your welder).

DYNASET welding generators are equipped either with compound or electronic EP-regulator.

EP-regulator ensures striking voltage  $U_{st}$  and controls welding current  $I_w$  by adjusting the excitation power according to actual demand.

IN AN ALTERNATOR MODE EPR WORKS AS AN AUTOMATIC VOLTAGE REGULATOR.

## AUTOMATIC VOLTAGE CONTROL IN ALTERNATOR MODE

Automatic voltage regulator adjusts rotor's excitation power, maintaining constant output voltage at discontinuous electric load.

Voltage control function depends on the rotor's rotation speed, so that the nominal voltage value is being set at nominal frequency.

Following voltage regulatos are used in DYNASET welders of k-series:

Compound regulator is connected to the auxiliary winding and maintains the output voltage constant through the entire load range with accuracy of  $\pm 5\%$ . Compound regulator sets the excitation current according to electric load of each phase with its separate current windings individually. Each phase can be loaded up to maximum current deliberately.

Electronic voltage regulator is connected to the stator's and separate excitation generator's windings, achieving an accuracy of  $\pm 3\%$ .

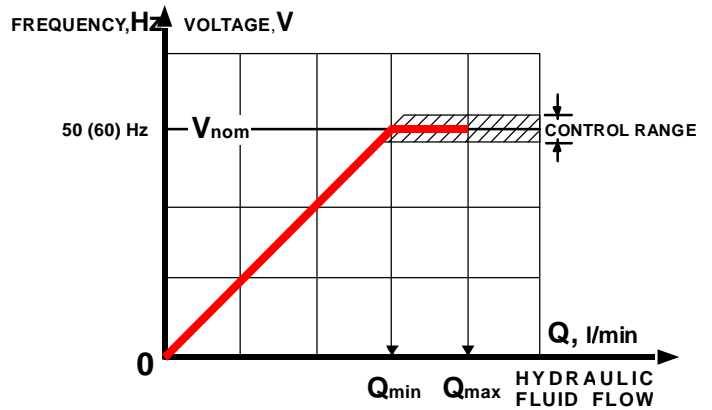
Electronic voltage regulator constantly compares output voltage to the pre-adjusted reference value and sets the excitation current according the load.

## PERFORMANCE OF AN AUTOMATIC FREQUENCY CONTROL VALVE

Automatic frequency control valve is to keep both rotation speed and frequency constant ( $\pm 5\%$ ) when incoming hydraulic oil flow ( $Q$ ) can vary from minimal (= nominal demanded flow  $Q_{nom} + 1 \dots 5$  l/min) up to value exceeding  $Q_{min}$  by 10 – 30 l/min depending on generator size.

$$Q_{min} = Q_{nom} + 1 \dots 5 \text{ l/min}$$

$Q_{min}$  - MINIMAL HYDRAULIC FLOW  
 $Q_{nom}$  - NOMINAL HYDRAULIC FLOW



**IN THE WELDING MODE** hydraulic flow must be kept at least MINIMAL. Hydraulic fluid flow's (= rotor's rotation speed) drop below the minimal rate causes welding performance degradation as well as striking voltage reducing, when arc striking becomes very difficult.

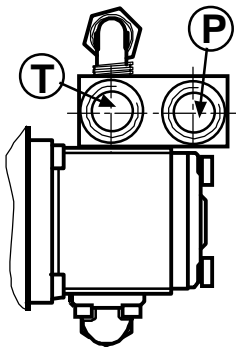
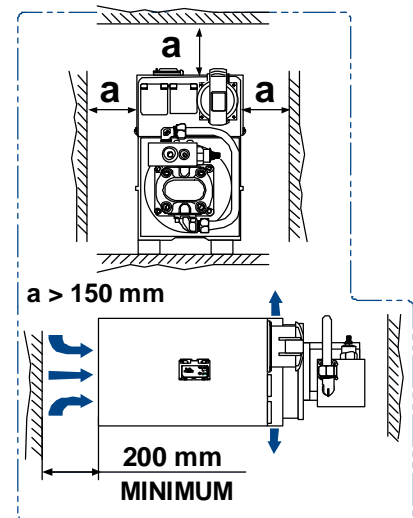
## CLASSIFICATION

DYNASET hydraulic generators are manufactured in conformity with the 98/37, 73/23, 89/336 CEE directives and their amendments. They are also manufactured in compliance with the following regulations: CEI 2-3, EN 60034-1, IEC 34-1, VDE 0530, BS4999-5000, CAN/CSA-C22.2, NF 51.100 and N°14-95 - N°100-95. By request DYNASET hydraulic generators can be equipped with a radio interference protection to meet requirements of specifications MIL STD 461 A/B and VDE 0875 class N.

## INSTALLATION

DYNASET hydraulic welder works installed into an original hydraulic system of any carrier machine.

DYNASET hydraulic welder can be placed deliberately ensuring an easy access to the unit. Position of a welder should be horizontal. Additionally, return line must be connected to a hydraulic oil tank directly in the shortest possible way in order to keep return oil pressure under 5 bar. Generally DYNASET's T-line is to be connected directly to the return line of a hydraulic system, when hydraulic fluid flows to the tank only through the return filter and cooler. Both filtering degree and cooling capacity of a hydraulic system should be sufficient (ref. to PARAMETERS).



It is possible to use DYNASET either as a mobile generator and connect hydraulic power with quick couplings, or make a fixed installation on a carrier machine. With DYNASET generator installed on your vehicle all electric power tools come easily along with you to any place.

To put DYNASET generator into operation only pressure- (P) and return (T) lines of a hydraulic system are to be connected to the unit's hydraulic ports. Ensure that the oil flow is sufficient to run the unit, i.e. at least the minimal flow must be available.

At the oil flow less than demanded nominal rate the unit will not work properly at all. If the oil flow is so excessive, that the automatic speed control valve is unable to handle it, the unit starts hunting. In the latter case the oil flow is to be reduced either by dropping down the rotation speed of hydraulic pump or using flow limiter valve.

**DYNASET priority valve is recommended.**

## INSTALLATION

After having been connected to the hydraulic system, DYNASET hydraulic generator is to be started by directing the oil flow to the unit's pressure port by means of control valve - manual or solenoid. Even simple ball valve or three-way valve can be used.

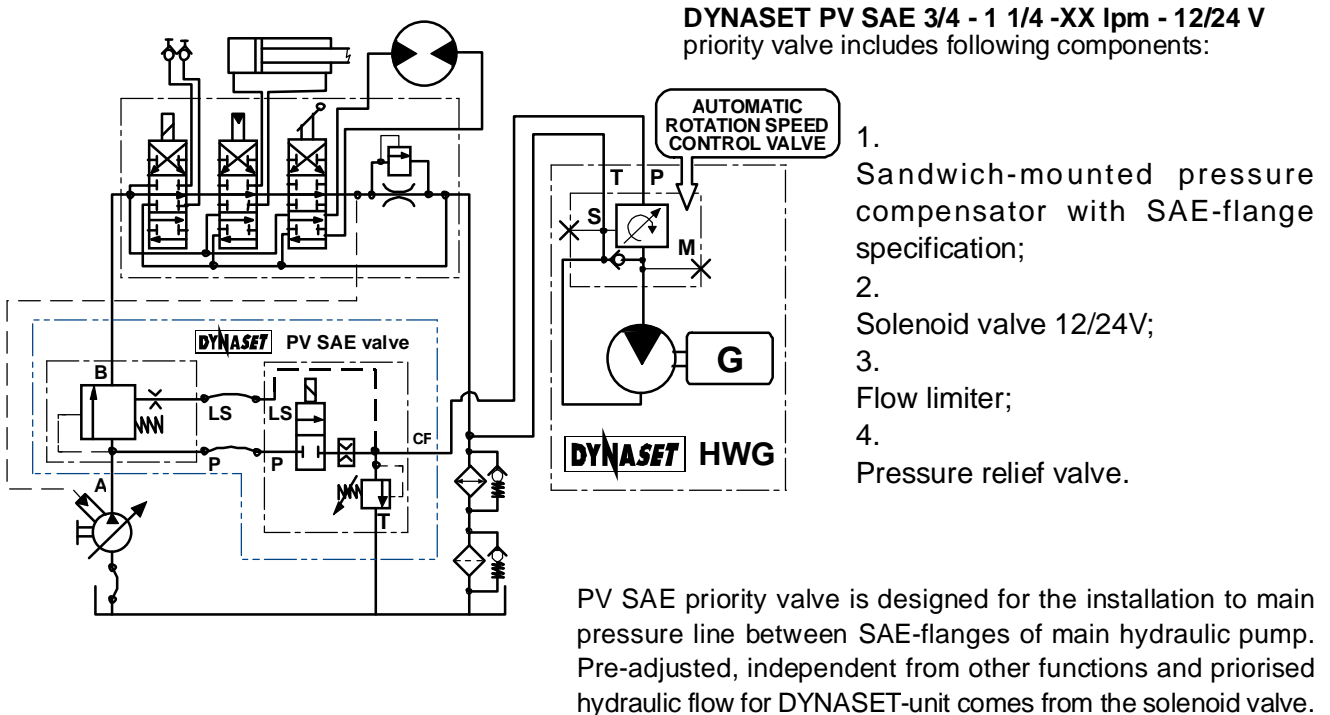
To ensure DYNASET's proper operation, the hydraulic pressure must be set to the level, at which at least the nominal power output is achieved (ref. to PARAMETERS). Lower pressure reduces output power. Maximum hydraulic pressure is 210 bar (ref. to PARAMETERS). If the hydraulic system main pressure is higher, service pressure relief valve must be used.

Ensure also that your machine oil cooling is working properly when DYNASET is in operation.

**DYNASET HYDRAULIC GENERATORS ARE DESIGNED FOR EASY INTEGRATION INTO HYDRAULIC SYSTEM OF ANY TYPE.**

### 1. OPEN CENTRE HYDRAULIC SYSTEM WITH VARIABLE DIPLACEMENT PUMP

The demanded hydraulic flow is to be ensured and controlled with a DYNASET PRESSURE COMPENSATED PRIORITY VALVE.



The rest of hydraulic pump's capacity is available for all other functions. Furthermore, pump's control works together with DYNASET PV SAE priority valve.

ALSO AVAILABLE for open centre hydraulic systems with variable displacement pump:

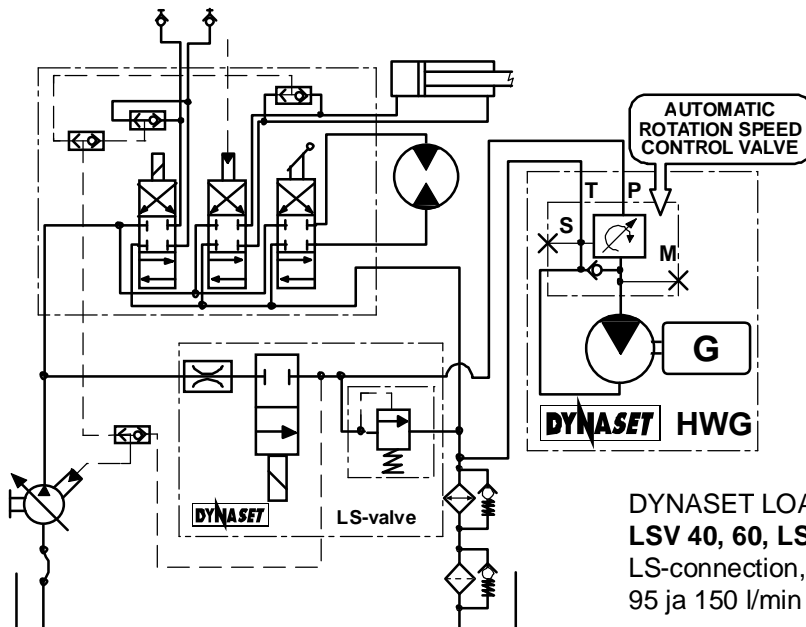
PRIORITY VALVE PV C3C  $\frac{3}{4}$  - 1  $\frac{1}{4}$  - 12/24 V.

**DYNASET PRIORITY VALVES enable to operate your DYNASET-unit simultaneously with other hydraulic executors.**

## INSTALLATION

## 2. CLOSED CENTRE HYDRAULIC SYSTEM WITH VARIABLE DISPLACEMENT PUMP

The demanded hydraulic flow is to be ensured and controlled with a DYNASET PRESSURE COMPENSATED LOAD SENSING (LS) VALVE.



DYNASET LS-valve includes following components:

1. Flow limiter;
2. Solenoid valve 12/24V;
3. Pressure relief valve;
4. Shuttle valve (OPTIONAL).

DYNASET LOAD SENSING VALVES:  
**LSV 40, 60, LSV 95 and LSV 150**

LS-connection, pressure relief, max. hydraulic flow 40, 60, 95 ja 150 l/min respectively.

DYNASET FLOW LIMITERS to the pressure line:

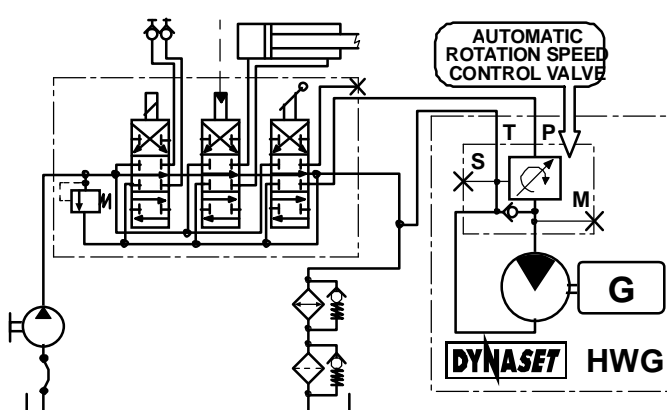
- VR 40 PK - 1/2**, max. 35 l/min, with pressure compensation;  
**VR 95 PK - 3/4**, max. 95 l/min, with pressure compensation.

ALSO AVAILABLE for closed centre hydraulic systems with variable displacement pump:

DYNASET SOLENOID VALVE to the pressure line for remote starting.

- SV 70 NC - 1/2 - 12 / 24 V** max 70 l/min with LS -connection;  
**SV 150 NC— 1 - 12 / 24 V** max 150 l/min with LS -connection.

## 3. HYDRAULIC SYSTEM WITH CONSTANT DIPLACEMENT PUMP



The demanded oil flow is to be ensured with proper hydraulic pump choice. In systems with redundant hydraulic flow an installation with **DYNASET PRIORITY VALVE** is recommended.

Installation with a standard pressure compensated 3-way valve should be avoided in order to close off potential waving in hydraulic system.

ALSO AVAILABLE for hydraulic systems with constant displacement pump:

DYNASET FREE CIRCULATION VALVE with solenoid and pressure control, type **VKV 90—3/4**.

## INSTALLATION

**ALTERNATOR MODE OUTPUT FREQUENCY ADJUSTING AT START-UP**

DYNASET hydraulic generator is tested and adjusted at factory but it is recommended to check the output frequency prior to taking the unit into operation.

**1**

Ensure that the generator is properly connected to the hydraulic system of your carrier machine and there are no oil leakages in system.

**2**

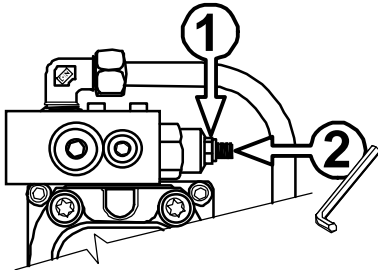
Start the engine of your carrier machine. Adjust the engine speed to the demanded level if necessary.

**3**

Start the generator with a control valve.

**4**

Check output frequency and tune it if necessary. For this purpose universal multimeter can be used. When the generator is running without load, switch the metering device to the Hz-position and check the frequency from each socket.



**5**

If the frequency is out of allowed range:

5.1

ensure whether the hydraulic fluid flow is on the demanded level.

5.2

set the frequency by adjusting the RPM-cartridge:

Loosen the checknut (1), make an adjustment (2) with adjusting screw according to the readings of frequency meter and then lock the checknut.

If a multimeter with frequency measurement is not available, operation of the generator can be tested by measuring the output voltage.

**NOTE !**

**When making adjustment, the hydraulic fluid should be at normal operation temperature !**

**IF DYNASET GENERATOR IS INSTALLED TO HYDRAULIC SYSTEM WITHOUT ORIGINAL DYNASET INSTALLATION VALVE:**

Usually installation to the hydraulic system is being made with traditional pressure compensated flow control valve.

**Regardless of hydraulic system—whether is of open or closed centre type - the setting should be made in following way to ensure proper installation of your generator:**

1.

Start your machine and switch on the DYNASET generator.

2.

Release the checknut 1 and turn the adjusting screw 2 clockwise for a couple of revolutions.

3.

Adjust the hydraulic fluid flow with pressure compensated flow control valve until the output frequency will achieve the value of 51—52 (61—62 Hz). Follow the readings of multimeter.

4.

Finalise the setting: turn the adjusting screw 2 counter-clockwise until it will take the flow under control—you'll feel it !

Then turn the screw back for a quarter of revolution and lock the setting with checknut 1.

HAVING ENSURED THE PROPER INSTALLATION AND OPERATION OF A WELDER, YOU CAN START IT.

## OPERATION - WELDING

Unplug all AC-consumers connected to welder's power outlets.

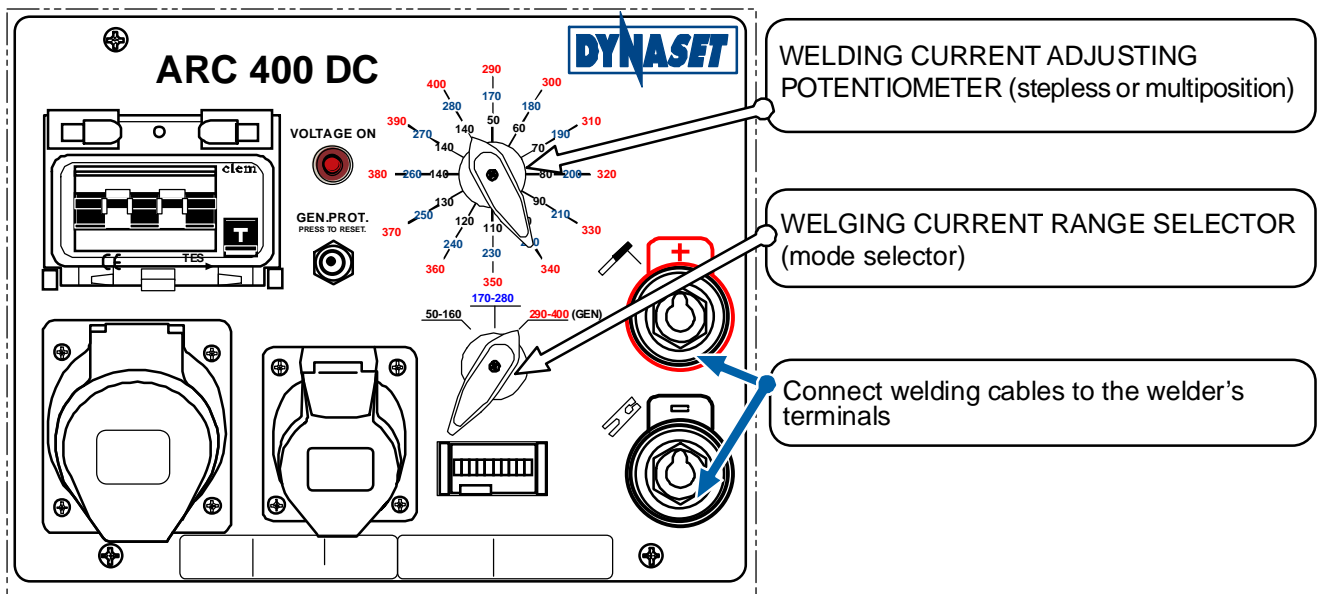
Choose welding electrodes to meet requirements of your job (ref. to electrode specifications printed on a package box) and adjust the welding current to the demanded level with control switches placed on a front panel of a welder:

WELDING CURRENT RANGE SELECTOR is to be turned to a required position and then current should be tuned within the chosen range with a WELDING CURRENT ADJUSTING POTENTIOMETER. Note that welding current range selector is usually assigned to work as mode selector (see below OPERATION - ALTERNATOR).

DYNASET welder is started by directing the hydraulic flow to the unit's pressure port.

Welding can be initiated when hydraulic flow achieves the minimal rate  $Q_{min}$  (ref. to the PARAMETERS).

Unit's status might be indicated with signal lamps/LEDs (VOLTAGE ON or Hz/V) if indication panel is included in welder's controls.



The welding arc is struck by scratching the electrode against the ground, when the striking pulse switches on. At the very moment of electrode's first contact to the ground striking voltage ( $U_{st} = 60 \dots 70V$ ) is available and an auxiliary electricity (AC/GEN) indicator goes OFF.

An arc being struck the current goes to the pre-set value if the electrode is about to stick. Anti-sticking control drops the welding current to make an electrode easy to be torn off after being cooled. When an electrode is stuck, an auxiliary electricity (AC/GEN) indicator is ON.

An arc being struck, the welding operation is to be carried on as with any other welding machine. Refer to the local instructions and regulations when necessary. Welding current levels within adjusted range, whereas the welding voltage levels within 20—32 VDC depending on welding electrode and worker's professional skill.

When the welding is finished, welder switches over to idle run.

Depending on welder's model welding circuit might be equipped with an overload indicator lamp (LED) as well as with an overload protection relay. If overload indicator starts flashing when welding, the welding current should be decreased. Check also your electrodes whether they are suitable for the job.

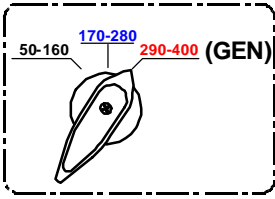
If the overload relay trips, set the load to proper level and push relay's pushbutton to reset it.

The hydraulic pressure under required minimum results in welder's rotation speed drop at maximum welding current setting. To enable welder's normal operation welding current should be adjusted downwards.

The hydraulic flow under minimum makes an arc striking difficult due to low power of striking pulse. In that case hydraulic flow can be increased by accelerating an engine.

An excessive hydraulic flow makes welder's operation instable. In the latter case the hydraulic flow is to be reduced either by dropping down the rotation speed of hydraulic pump or using flow limiter. DYNASET PRIORITY VALVE is recommended.

**OPERATION- ALTERNATOR MODE**

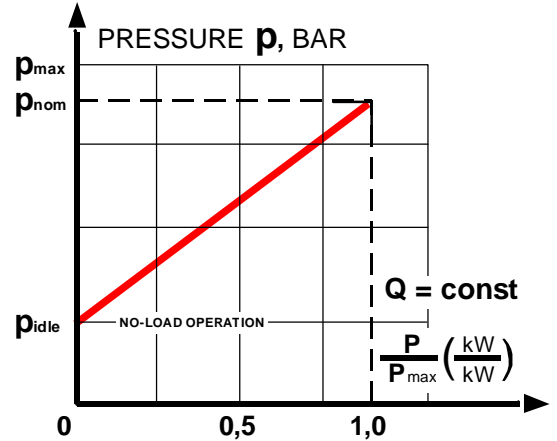


Prior to plugging electric consumers to welder's sockets, set mode selector (welding current range switch) to position GEN (all AC-current related measurements must be made the switch being set to GEN-position).  
If the selector does not have assigned GEN-position, set all regulators of the unit to MAX.

Auxiliary electricity circuit is protected against overload with an automatic circuit breaker. Actuated circuit breaker is to be reset by pressing it's push button on unit's control panel.

The welder is being loaded in AC-mode by turning on any AC-consumer - work light, angle grinder, electric motor etc. - plugged into unit's sockets. Hydraulic pressure levels according to the consumer's actual power demand when hydraulic fluid flow remains constant.

DYNASET hydraulic generator produces high quality electric power within pressure range from **idle run pressure** to the maximum allowed value (refer to the PARAMETERS). The nominal power output is achieved at pressure value, which is noticeably less than the maximum allowed operation pressure. Refer to the attached diagram.



Electric consumers can be left plugged to welder's power outlets, if the unit will be consequently started after shut-down as a AC-generator.

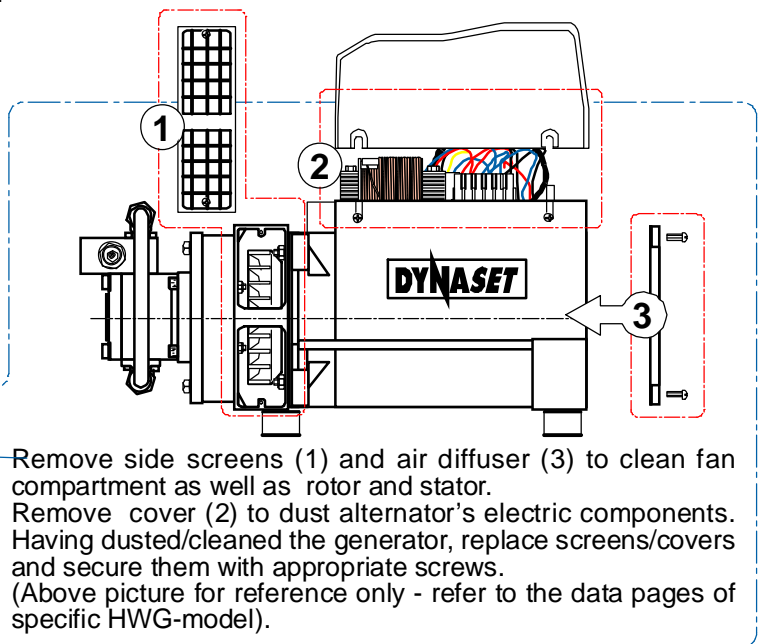
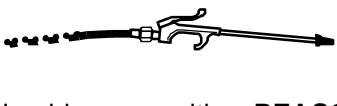
**PRIOR TO RESUMING THE WELDING OPERATION, UNPLUG ALL AC-CONSUMERS AND ADJUST WELDING CURRENT TO MEET REQUIREMENTS.**

**MAINTENANCE**

DYNASET hydraulic generators are low-maintenance units. Only normally wearing parts such as sealings in hydraulics, brush collector and bearings should be replaced when necessary. Refer also to the TROUBLESHOOTING section.

**ATTN. !**

**CLEANLINESS OF YOUR HWG-UNIT MUST BE MAINTAINED ON A REGULAR BASIS. CHECK YOUR EQUIPMENT AFTER EVERY WORKING SHIFT AND DEPENDING ON AN OPERATIONAL ENVIRONMENT CLEAN A GENERATOR AS FREQUENTLY AS NECESSARY TO KEEP IT IN PERFECT WORKING CONDITION.**

Use blow gun with a **REASONABLE DELIBERATION** to dust your equipment.

Remove side screens (1) and air diffuser (3) to clean fan compartment as well as rotor and stator. Remove cover (2) to dust alternator's electric components. Having dusted/cleaned the generator, replace screens/covers and secure them with appropriate screws. (Above picture for reference only - refer to the data pages of specific HWG-model).



**MAINTENANCE**

Remove all oil deposits. Remove all unnecessary grease and oil from the unit. Accumulated grease and oil can cause overheating and subsequent generator damage and may present a potential fire hazard. Do not leave in the generator case or control box anything which does not belong to the assembly.

The tightness of lids and covers as well as of all screw joints must be inspected on a regular basis, for instance at least once a week or more frequently, if a generator is exposed to a noticeable vibration.

Having carried a maintenance or cleaning, NEVER LEAVE ALTERNATOR'S COVER AND/OR ELECTRIC BOX' COVER UNREPLACED AND UNSECURED ! Condition of any seal/gasket must be inspected and defective parts replaced.

**HYDRAULIC FLUIDS**

Wide range of standard hydraulic fluids can be used with the DYNASET hydraulic equipment. Depending on the operating temperature, following mineral hydraulic oils are recommended:

ISO VG 32	for oil's operation temperature up to 70 °C;
ISO VG 46	for oil's operation temperature up to 80 °C;
ISO VG 68	for oil's operation temperature up to 90 °C.

Synthetic and bio-oils can be used as well if their viscosity characteristics and lubricating efficiency are corresponding to above mineral oils. Automatic transmission fluids and even engine oils can be used, provided that they are allowed to be used in hydraulic system of your carrier machine.

To use special hydraulic fluids a with DYNASET equipment, please be kindly requested to contact nearest DYNASET representative for an advice.

**SAFETY**

The generator's output voltage is as high as 220 V. Operators and maintenance personnel must always comply with local safety regulations and precautions in order to close out the possibility of damages and accidents.

The hydraulic system is usually pressurised up to 210 (420) bar. Follow all your local safety instructions related to the high pressure hydraulics.

**TECHNICAL CONDITION OF YOUR MACHINERY AND EQUIPMENT MUST BE SUBJECTED TO CONSTANT SURVEILLANCE.** Hydraulic system of a carrier machine should be maintained according to the service program. All couplings, valves and hoses of the system should be leak-proof and kept clean in order to follow their technical condition.

Hydraulic leakages must be rectified immediately to avoid injuries caused by hot oil blowouts.

Prior to maintenance, detaching from a carrier or disassembling a DYNASET-unit, the hydraulic system of a machine should be stopped and DYNASET's hydraulic circuit depressurised.

When using DYNASET hydraulic welder, appropriate protective clothing, safety goggles and gloves should be worn. Do not touch parts heated by hydraulic oil.

**WHEN CARRYING OUT ANY SERVICE DISASSEMBLING OR REPAIR OF DYNASET HYDRAULIC UNIT (AND/OR HYDRAULIC SYSTEM OF A CARRIER MACHINE), ABSOLUTE CLEANLINESS MUST BE MAINTAINED TO ENSURE RELIABLE AND TROUBLE-FREE OPERATION OF YOUR EQUIPMENT.**

All installation and service of both hydraulic and electric equipment must be performed by qualified and experienced personnel only.

**ENSURE THAT THE WELD ELECTRIC FIELD DOES NOT DAMAGE OTHER ELECTRIC AND ELECTRONIC EQUIPMENT AND INSTRUMENTATION. FOR THE DURATION OF WELDING OPERATION ALL SENSITIVE ELECTRIC AND ELECTRONIC UNITS, DEVICES AND INSTRUMENTS, SUCH AS AC-CHARGERS, ELECTRONIC SENSORS, CONTROL AND MEASUREMENT INSTRUMENTS, SHOULD BE SWITCHED OFF AND UNPLUGGED.**

**TROUBLESHOOTING****ALTERNATOR MODE**

<p><b>1.1</b> <b>AC-ELECTRICITY</b> is not available, though the welder rotates at proper speed and front panel's AC-indicator is ON.</p>	<p>AC-voltage socket's automatic circuit breaker tripped on overload and left unresetted.</p>	<p>Reset an automatic circuit breaker with its push button on front panel</p>
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<p><b>1.2</b> <b>LOW OUTPUT VOLTAGE AT NO LOAD</b></p>	<p>1.2.1 Too low rotation speed of generator.</p> <p>1.2.2 Excitation rectifier's failure.</p> <p>1.2.3 Poor contact in electric system.</p> <p>1.2.4 Voltage regulator's failure.</p> <p>1.2.5 Winding failure.</p>	<p>1.2.1.1 Check first the output frequency. If the frequency is out of range, hydraulic system failure is concerned.</p> <p>1.2.1.2 Check whether the hydraulic fluid flow and pressure are sufficient. Adjust when necessary.</p> <p>1.2.1.3 Check the hydraulic motor for possible leakage. Replace motor if necessary.</p> <p>1.2.2 Trace the failure and replace the rectifier.</p> <p>1.2.3 Check all internal contacts and wiring of the generator. Check and clean brushes and slip ring.</p> <p>1.2.4.1 Check and adjust the air gap of the compound regulator. Replace if broken. (HWG 180 - HWG220, HWG 400).</p> <p>1.2.4.2 Check and adjust or replace the electronic regulator (HWG 300-HWG 400).</p> <p>1.2.5 Verify the winding resistance with parameters shown in technical specification and replace if damaged. <b>ATTN !</b> Prior to measuring an insulation resistance, set overload protection to OFF-position !</p>
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## TROUBLESHOOTING

## ALTERNATOR MODE

<p><b>1.3</b> <b>LOW OUTPUT VOLTAGE AT LOAD, WHILE NO-LOAD VOLTAGE IS CORRECT</b></p>	<p>1.3.1 The generator is being overloaded.</p> <p>1.3.2 Too low rotation speed of generator.</p> <p>1.3.3 Voltage regulator's failure.</p>	<p>1.3.1 Reduce the load and check the current I (A) to ensure that the proper load is being applied.</p> <p>1.3.2.1 Hydraulic pressure insufficient.</p> <p>1.3.2.2 Hydraulic system failure to be traced and cleared.</p> <p>1.3.2.3 Hydraulic motor worn out. Replace hydraulic motor.</p> <p>1.3.3.1 Check and adjust or replace the compound regulator (HWG180 - HWG220, HWG 400).</p> <p>1.3.3.2 Check and adjust or replace the electronic regulator (HWG 300-HWG 400).</p>
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<p><b>1.4</b> <b>EXCITATION FAILURE</b></p>	<p>1.4.1 Rectifier's failure.</p> <p>1.4.2 Voltage regulator's failure.</p> <p>1.4.3 Winding failure.</p> <p>1.4.4 Poor contact in electric system.</p> <p>1.4.5 Insufficient residual magnetism.</p>	<p>1.4.1 Trace the failure and replace the rectifier.</p> <p>1.4.2.1 Check and adjust or replace the compound regulator (HWG180-HWG220, HWG 400).</p> <p>1.4.2.2 Check and adjust or replace the electronic regulator (HWG 300-HWG 400).</p> <p>1.4.3 Verify the winding resistance with parameters shown in technical specification and replace if damaged.</p> <p>1.4.4 Check all internal contacts and wiring of the generator. Check and clean brushes and slip ring.</p> <p>1.4.5 Use external battery to magnetise the rotor.</p>
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## TROUBLESHOOTING

## ALTERNATOR MODE

<p><b>1.5 OUTPUT VOLTAGE INSTABILITY</b></p>	<p>1.5.1 Instable rotation speed of generator.</p> <p>1.5.2 Electronic voltage regulator's failure (HWG 300—HWG 400).</p> <p>1.5.3 Poor contact in electric system.</p>	<p>1.5.1.1 Check generator's hydraulics, including automatic frequency control valve. Make an adjustment if necessary.</p> <p>1.5.1.2 Check whether the hydraulic fluid flow and pressure are excessive. Adjust when necessary.</p> <p>1.5.1.3 Check the hydraulic motor for possible leakage. Replace motor if necessary.</p> <p>1.5.2 Adjust stability of the regulator. Replace if broken.</p> <p>1.5.3 Check all internal contacts and wiring of the generator. Check and clean brushes and slip ring.</p>
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## WELDING MODE

<p><b>2.1 AN WELDING ARC CAN NOT BE STRUCK OR IS DIFFICULT</b></p>	<p>2.1.1 Too low rotation speed of the welder.</p> <p>2.1.2 Winding failure</p>	<p>2.1.1 Ref. to items 1.2.1.1 - 1.2.1.3</p> <p>2.1.2 Verify the winding resistance with parameters shown in technical specifications and replace stator/rotor if damaged.</p>
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<p><b>2.2 LOW WELDING CURRENT</b></p>	<p>2.2.1 Welding current setting does not meet required level.</p> <p>2.2.2 Too low rotation speed of generator.</p> <p>2.2.3 Excitation rectifier's failure.</p> <p>2.2.4 Winding failure.</p>	<p>2.2.1 Check welding current requirements (ref. electrode package) and turn selectors in appropriate position.</p> <p>2.2.2.1 Check whether the hydraulic fluid flow and pressure are sufficient. Adjust when necessary.</p> <p>2.2.2.2 Check the hydraulic motor for possible leakage. Replace motor if necessary.</p> <p>2.2.3 Trace the failure and replace the rectifier.</p> <p>2.2.4 Verify the winding resistance with parameters shown in technical specification and replace if damaged.</p>
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## TROUBLESHOOTING

## WELDING MODE

<b>2.3 EXCESSIVE WELDING CURRENT</b>	<p>2.3.1 Welding current setting does not meet required level.</p> <p>2.3.2 Too high rotation speed of generator.</p>	<p>2.3.1 Check welding current requirements (ref. electrode package) and turn selectors in appropriate position.</p> <p>2.3.2 Failure of automatic rotation speed control valve concurrently with excessive hydraulic fluid flow. Replace the automatic rotation speed control valve.</p>
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<b>2.4 INSTABLE WELDING CURRENT</b>	<b>REF. TO ITEM 1.5</b>
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## OTHER MALFUNCTIONS

<b>3. ABNORMAL NOISE LEVEL</b>	<p>3.1 Bearing failure.</p> <p>3.2 Generator is being overloaded.</p> <p>3.3 Short circuit in powered unit.</p> <p>3.4 Foreign items in generator's casing.</p> <p>3.5 Extremely fluctuating load.</p>	<p>3.1 Replace broken bearing.</p> <p>3.2 Reduce the load to the proper level.</p> <p>3.3 Check powered unit. Rectify a defect.</p> <p>3.4 Stop generator and hydraulic system. Remove foreign item from unit.</p> <p>3.5 Can it be fixed ?</p>
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<b>4. OIL LEAKAGES</b>	<p>4.1 Failure of axial sealing of generator's hydraulic motor. External indication—hydraulic oil outflow from ventilation grids.</p> <p>4.2 Oil leakage from hydraulic motor.</p>	<p>4.1 Axial sealing of hydraulic motor broken by reason of EXCESSIVE PRESSURE IN RETURN LINE. Rebuild the return line. Maximum allowed pressure in return line is 5 bar. Replace axial sealing of generator's motor.</p> <p>4.2 Hydraulic motor worn out and should be replaced.</p>
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## TECHNICAL SPECIFICATIONS

PARAMETERS	HWG 180/6k-33	HWG 220/6k-48	HWG 300/8k-68	HWG 400/10k-81
WELDING CURRENT A	40 - 180 ADC	40 - 220 ADC	40 - 300 ADC	30 - 400 ADC
WELDING ELECTRODE mm	Ø 4 mm	Ø 5 mm	Ø 6 mm	Ø 7 mm
WELDING CURRENT ADJUSTMENT	selector switch			continuous regulator
	3 x 7 positions	3 x 7 positions	2 x 11 positions	10 - 100%
LOAD DUTY ED	50% / 180 A 100%/110 A	35% / 220 A 60% / 170 A	35% / 300 A 60% / 250 A	60% / 400 A
ARC STRIKING VOLTAGE V	73 VDC	73 VDC	70 VDC	70 VDC
WELDING VOLTAGE V	21,6 - 28,8	21,6 - 28,8	21,6 - 32 VDC	21,6 - 36 VDC
AUXILIARY ELECTRICITY	synchrogenerator 50 Hz			
1-phase	230 VAC/3,0 kVA	230 VAC/3,5 kVA	230 VAC/3,2 kVA	230 VAC/ 4,0 kVA
3-phase	400 VAC/6,0 kVA	400 VAC/6 ,5kVA	400 VAC/8,0 kVA	400 VAC/10,0 kVA
socket 2P+PE 16A	1 pc	1 pc	1 pc	1 pc
socket 3P+N+PE 16A	1 pc	1 pc	1 pc	1 pc
HYDRAULIC REQUIREMENTS				
Hydraulic oil flow min l/min max l/min	36 l/min 50 l/min	51 l/min 70 l/min	72 l/min 93 l/min	86 l/min 103 l/min
Hydraulic oil pressure bar	operating pressure 50 - 190 bar / max. 210 bar			
Pressure in return line bar	Continuous 5 bar / peak 10 bar			
HYDRAULIC CONNECTORS				
Pressure line P	BSP 1/2"	BSP 1/2"	BSP 3/4"	BSP 3/4"
Return line T	BSP 1/2"	BSP 1/2"	BSP 1"	BSP 1"
HYDRAULIC OIL	10 - 200 cSt / optimal 25 - 35 cSt			
Viscosity cSt	max. 70 °C			
Temperature °C	min. 25 µm			
FILTRATION RATIO (recommended)				
WEIGHT	50 kg	52 kg	92 kg	138 kg
OUTER DIMENSIONS				
Length mm	630	640	620	785
Width mm	200	200	292	310
Height mm	380	380	435	595
ACCESSORIES	OPTIONAL			
Voltmeter, 1 phase	included			
Overheating relay	included			
Automatic circuit breaker	5 m			
Welding cables				
PROTECTION CLASS	IP 21 / IP 23			

## MANUFACTURER'S LIMITED WARRANTY

### 1. Warranty coverage

All hydraulic accessories manufactured by DYNASET OY are subject to the terms and conditions of this limited warranty. Products are warranted to the original purchaser to be free from defects in materials or workmanship. Exclusions from warranty are explained in item 8.

### 2. Beginning of warranty period

Warranty period begins from the delivery date of the product. Delivery is considered to be done on the date when installation has been accomplished or purchaser has taken the product in use. Product is considered as taken in use at the date when DYNASET OY has delivered the product to purchaser, unless separately agreed otherwise by written agreement.

### 3. Warranty period

Warranty period is twelve (12) months based on maximum of 2000 hours usage during this time period. In cases where the system is provided complete with certain special components (e.g. drive unit), those components are considered as a subject to their manufacturer's warranty.

### 4. Warranty procedures

Immediately upon identifying a problem which purchaser believes to be a failure subject to the product's limited warranty, purchaser must contact primary to the seller of the product. Contact must be made as soon as possible, latest thirty (30) days after the problem was identified. Seller and/or manufacturer technical staff determines the nature of the problem primarily by phone or e-mail. Purchaser commits to give necessary information and to perform routine diagnostic procedures in order to determine the nature of the problem and necessary procedures.

### 5. Warranty repairs

If the product is found to be defective during the warranty period, DYNASET OY will, at its option, either repair the product, author it to be repaired at its authorized workshop or exchange the defective product. If the product must be repaired elsewhere than premises of DYNASET OY or authorized workshop, all costs excluded from this warranty (traveling and waiting hours, daily allowance, traveling expenses and uninstallation/reinstallation costs) will be charged from the purchaser.

If the problem is not covered by this limited warranty, DYNASET OY has the right to charge purchaser of troubleshooting and repairing.

### 6. Delivery terms of warranty repair

If the product is found possible to be defective under this limited warranty and it needs to be repaired, DYNASET OY gives Warranty Return Number (WRN). Items being returned must be shipped, at the purchaser's cost, adequately packed for shipment, to the DYNASET OY or to other location authored by DYNASET OY.

Shipment documents must contain:

- Purchaser's name and contact information
- Receipt of original purchase
- WRN code
- Problem description

### 7. Warranty of repaired product

Warranty period of the product repaired under this limited warranty continues to the end of original warranty period.

### 8. Exclusions from warranty

This warranty shall not apply to:

- a. Failures due to normal wear and tear, improper installation, misuse, abuse, negligence, purchaser selection of improper product to intended use, accident, improper filtration of hydraulic oil or intake water or lack of maintenance
- b. Cost of maintenance, adjustments, installation or startup
- c. Coating, hydraulic oil, quick couplings and interconnection hoses (internal or external to system assemblies)
- d. Products altered or modified in a manner not authorized by DYNASET OY in writing
- e. Products which have been repaired during warranty period by others than DYNASET OY or its authorized workshop
- f. Costs of any other damage or loss, whether direct, indirect, incidental, special or consequential, arising out of the use of, or the inability to use, the product
- g. Telephone or other communications expense
- h. Product that is used in exceptional conditions, considered to cause excessive wear and tear
- i. Faults caused by nature phenomenon's like flood, thunder, etc.

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