Danfoss OP-LSVM Optyma Slim Packaged Condensing Unit Instruction Manual

Contents

Danfoss OP-LSVM Optyma Slim Packaged Condensing Unit

Product Information

Specifications:

- **Model:** OptymaTM Slim Pack OP-LSVM, MSTM, MSSM, MSIM
- **Refrigerant Type:** A2L
- **Year:** 2018
- **Manufacturer:** Danfoss

Product Usage Instructions

Safety Precautions:

- Do not operate the unit in a flammable atmosphere.
- Ensure proper ventilation for the compressor compartment.
- Do not modify Potentiometer settings with hand tools.
- Always switch off the unit at the main switch before servicing.

Installation Guidelines:

- The unit must be installed above floor level for proper ventilation.
- Mount PRV during installation as per PED Cat I & II model guidelines.
- Place the unit to avoid blocking walking areas, doors, or windows.

Maintenance Instructions:

- Flush the refrigerant system with dry air or nitrogen after opening.
- Use safety devices like pressure switches and relief valves in compliance with regulations.
- Check and set high-pressure switches and relief valves within service pressure limits.

Service Panel Removal:

For W05 Version:

1. Disconnect the power supply.
2. Remove the top panel screws and top panel.
3. Remove side panel screws and side panel parallel to the main switch.
4. Ensure no refrigerant penetration inside the electrical panel before connecting to the power supply.

For W09 Version:
Disconnect the power supply and turn off the main switch.

Frequently Asked Questions (FAQ)

- **Q: Can I use hand tools to modify the Potentiometer setting?**
  A: No, only use hands with proper PPE for this operation to avoid risks to performance and compressor safety.
- **Q: How should I position the unit during installation?**
  A: Ensure the unit is placed above floor level for good compressor compartment ventilation and avoid blocking walking areas, doors, or windows.

Optyma™ Slim Pack
OP-LSVM, MSTM, MSSM and MSIM

Relevant Standards and Directive

- EN 378-2:2016: Refrigerating Systems And Heat Pumps-Safety And Environmental Requirements.
- EN 60335-1: Household And Similar Electrical Appliances – Safety –Part 1: General Requirements
- Low Voltage Directive n° 2014 / 35 / UE
- Machinery Directive n° 2006 / 42 / CE
- Pressure Equipment Directive (PED) no. 2014/68/EU
- RoHS Directive 2011/65/EU
- WEEE Directive 2012/19/EU

(Other local applicable standards)

Introduction

These instructions pertain to OptymaTM Slim Pack condensing units OP-LSVM, MSTM, MSSM, and MSIM (R448A, R449A, R452A, R407A, R407F, R507, R404A, R134a, R513A, R1234yf, R454C & R455A) used for refrigeration systems. They provide necessary information regarding the safety and proper usage of this product.

The condensing unit includes the following:

- Scroll/reciprocating compressor
- Microchannel heat exchanger
- Dual pressure switches
- Service valves suction/liquid with Schrader Valve
- AC Fan motor for B1 & B2, EC Fan motor for B3 units

- Weather proof housing
- Filter drier (Flare connections)
- Crankcase heater for compressor
- Receiver with stop valve
- Sight glass (Flare connections)
- IP54 fully pre-wired electrical panel (including compressors contactor, overload relay, timer)
- Fans speed controller*
- Main switch with extended Rotary handle**
- Components connected are equipped with Schrader port
    - Factory pre-mounted for W09, not factory pre-mounted for W05.
    - Only for W09

Handling and storage

- It is recommended not to open the packaging before the unit is at the final place for installation.
- Handle the unit with care. The packaging allows for the use of a forklift or pallet jack. Use appropriate and safe lifting equipment.
- Store and transport the unit in an upright position.
- Store the unit between -35°C and 50°C.
- Don’t expose the packaging to rain or a corrosive atmosphere.
- After unpacking, check that the unit is complete and undamaged.

Installation precautions

Do not braze as long as the condensing unit is under pressure.
It’s not allowed to operate the unit in a flammable atmosphere.
Place the unit in such a way that it is not blocking or hindering walking areas, doors, windows, or similar.
A2L refrigerants are heavier than air. The unit has to be installed above floor level to have good compressor co mpartment ventilation.
PRV: For PED Cat I & II models, PRV shall be mounted at field during installation.

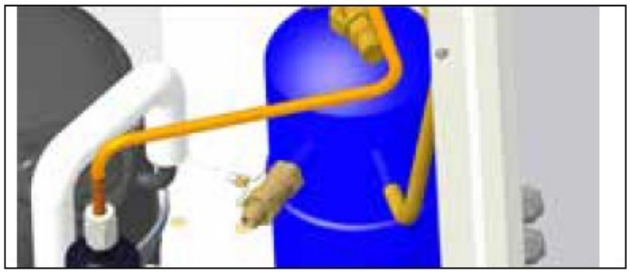
- Ensure adequate space around and below the unit for proper air circulation and to open doors. Refer to Annex – A, Picture 1 for minimum distance to walls and ground.
- Avoid installing the unit in locations that are daily exposed to direct sunshine for longer periods.
- Avoid installing the unit in aggressive and dusty environments.
- Ensure a foundation with a horizontal surface (less than 3° slope), is strong and stable enough to carry the entire unit weight and to eliminate vibrations and interference.
- The unit ambient temperature shall not exceed 50°C during off-cycle.
- Ensure that the power supply corresponds to the unit characteristics (See nameplate in unit).
- When installing units for R454C, R455A & R1234yf refrigerants, use equipment specifically reserved for mildly flammable refrigerants which was never used for other CFC, HFO, or HCFC refrigerants.
- Use clean and dehydrated refrigeration-grade Copper / Aluminium tubes with appropriate thickness and silver

alloy brazing material.

- Use clean and dehydrated system components.
- The suction piping connected to the compressor must be flexible in 3 dimensions to dampen vibrations. Furthermore, piping has to be done in such a way that oil return for the compressor is ensured and the risk of liquid slug over in the compressor is eliminated.
- In Optima condensing unit has a suction and liquid service valve with Schrader port for field service operation

PRV Valve (Not factory fitted)

- For Optyma™ Slim Pack, Condensing units that fall in PED cat I & II, PRV shall be fitted (See Technical data for PED category in Annex A).
- PRV is used as damage limiting device, not as pressure limiting device.
- PRV to be fitted on liquid receiver at 3/8″ NPT Connection. (Refer to Coolselector2 for PRV spare part code). Use Locatite 554 for PRV fitment.
- Torque: 40Nm (Don’t exceed given torque)



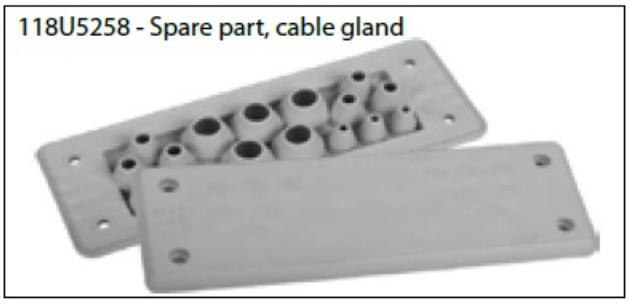
- The installer needs to take care of where to blow the leaked refrigerant. Danfoss recommended blowing the refrigerant away form the condensing unit.
- Recommended to change PRV when after discharge, Changing refrigerant.
- Don’t remove the seal and attempt to reset the valve.
- Valves must be installed vertically or Horizontally, but ensure PRV is fitted above the system’s liquid level.
- Ensure refrigerant is released safely into the atmosphere directly.
- Incase of a hazard, an additional spare kit has been designed to collect the released refrigerant. The kit should be installed with proper piping routing for the discharge of refrigerant safely. (See picture below)

- PRV should not be installed on the service valve.
- Replace PRV after clean out of the system or bared out.
- No Detachable joints and valves should not accessible to the public. All brazing joints should comply with EN 14276-2 and other permanent joints should comply with EN-16084.

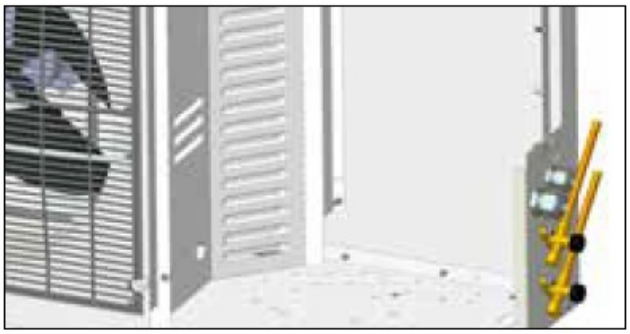
Installation

- Installation/servicing of Optyma™ Slim Pack condensing units must be carried out by qualified personnel concerning applicable local/international regulations.

- The installation in which the condensing unit is installed must comply with EC Pressure directive (PED) no. 2014/68/EU. The condensing unit itself is not a ”unit” in the scope of this directive.
- The unit must be securely installed on a stable and rigid support and fixed from the beginning. See Annex-A, Picture 2.
- It is recommended to install the unit on rubber grommets or vibration dampers (not supplied).
- Slowly release the nitrogen-holding charge through the Schrader port. Refer to image Annex-A, Picture 3.
- Connect the unit to the system as soon as possible to avoid oil contamination from ambient moisture.
- Avoid material entering into the system while cutting tubes. Never drill holes where burrs cannot be removed.
- Braze with great care using state-of-the-art technique and vent piping with nitrogen gas flow.
- Connect the required safety and control devices. When the Schrader port is used for this, remove the dummy cap.
- It is recommended to insulate the suction pipe from the evaporator up to the compressor inlet with 19 mm thick insulation.
- Make sure there is no refrigerant or damage inside the unit and cracks in pipes.
- Make sure that all components inside the electrical box are protected against electrical overload and ‘‘not a source of ignition’’ from their respective manufacturer for approved refrigerants.
- Field wiring must be routed through IP65 cable glands and cable entry plate only. For any additional wire routing, drilling, or piercing of electrical panel sides is strictly prohibited.
- For field wiring, only the required hole is to be pierced. No pierced hole should be left without cable in it. If undesired/unwanted piercing happens entire gland plate should be replaced.



- The partition panel has dedicated openings for pre ventilation, do not seal/obstruct/close the openings in any manner.



- In the event of uncertain leakages, To avoid refrigerant concentration in the compressor compartment, the compressor has an on-time delay of 30 seconds (factory setting) do not reduce the setting below 30 seconds.
- Copper piping material should comply with EN12735-1. All pipe joints should comply with EN14276-2
- At filed installation, support to added according to size and weight. Recommended maximum spacing for pipe support as per EN12735-1 & EN12735-2
- Connecting pipes shall be made before opening the valves to permit refrigerant to flow between the

refrigerating system parts.

Leak detection
Never pressurize the circuit with oxygen or dry air. This could cause fire or explosion.

- Do not use dye for leak detection.
- Perform a leak detection test on the complete system.
- The maximum test pressure is 25 bar.
- When a leak is discovered, repair the leak and repeat the leak detection.

Vacuum dehydration

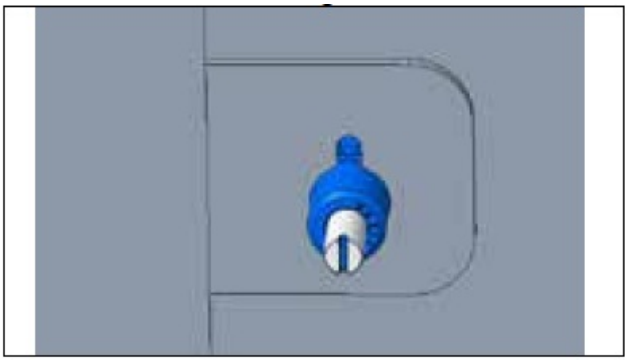
- Never use the compressor to evacuate the system.
- Connect a vacuum pump to both the LP & HP sides.
- The vacuum pump must be certified to use in A2L refrigerant environment or ATEX certified.
- Pull down the system under a vacuum of 500 µm Hg (0.67 mbar) absolute.
- Do not use a megohmmeter nor apply power to the compressor while it is under vacuum as this may cause internal damage.

Electrical connections

- Verify that all electrical connections inside the condensing unit are properly fastened as they could have worked loose during transportation.
- Switch off and isolate the main power supply.
- Ensure that the power supply can not be switched on during installation.
- All electrical components must be selected per EN60335-1, EN60204, or local applicable standards and unit requirements.
- Refer to the wiring diagram for electrical connection details.
- All electrical components must be qualified to use A2L refrigerants and ‘‘not source of ignition’’.
- Ensure that the power supply corresponds to the unit characteristics and that the power supply is stable (allowable voltage tolerance ±10% and allowable frequency tolerance ±2,5 Hz).
- The power supply cables must be according to unit data for voltage, current, and ambient conditions. Refer Nameplate for voltage and current information.
- Protect the power supply and ensure correct earthing.
- Optyma™ Slim pack condensing unit starting frequency needs to be limited for reciprocating compressors
    - Without a starting capacitor 5 starts per hour maximum.
    - With a starting capacitor 10 starts per hour maximum.
- Make the power supply according to local standards and legal requirements.
- The unit is equipped with high and low-pressure switches, which directly cut the power supply to the compressor and provide 230V AC alarm signals (max. 50VA) in case of activation (Alarm signal wirings must be done on field. Refer wiring diagram for more details). Parameters for high and low-pressure cutouts should be set by the installer considering compressor model, refrigerant, and application.
- Determine the phase sequence by using a phase meter to establish the phase orders of line phases L1, L2, and L3.

- Connect line phases L1, L2, and L3 to main switch terminals T1, T2 and T3 respectively.
- The timer should have a minimum setting of 30 sec for pre-ventilation. Rotate clockwise and set the arrow to 30s marking or above (refer to below image)

- B3 units (both W05 & W09 versions) assembled with EC fan Motor are equipped with a Potentiometer of 10kohms (refer to the image and wiring diagram). These are factory set for Fan to rotate at 80% speed. This is done to restrict the Noise emission and is suitable to operate at 43°C Ambient. If the Fan speed is to be increased, rotate the Potentiometer setting in a clockwise direction.



  - Do not use any Hand tools to modify the Potentiometer setting. This operation must be done by Hand with proper PPE.
  - Do not rotate this Potentiometer setting screw in a Counter-clockwise direction. This can potentially reduce the fan speed, risking the performance and compressor safety

Safety

- The electrical box door should be in closed condition before connecting to the power supply.
- The discharge tube temperature will go upto 120°C during the unit running conditions.
- Recommended to install PRV inside the unit and the release of refrigerant should routed to the atmosphere directly.

Units will be with a 3/8″ NPT adapter plug. Users can select various options as mentioned in EN378-2:2016 Article § 6.2.2.3

- The unit/installation into which the condensing unit is mounted/integrated must be by the PED.
- As per EU F-gas regulation, R1234yf, R454C & R455A are considered as A2L refrigerant. Optyma™ Slim Pack units are qualified with R1234yf, R454C & R455A. All precaution and safety measures to be taken care of before and after installation.
- All Optyma™ Slim pack condensing units are supplied with an adjustable dual pressure switch (KP-17WB) with a maximum 0.5A current rating.
- To avoid an electric arc between hermetic connector pins, the compressor must not start, or electrical tests such

as dielectric strength must not be performed while the refrigerating system is under vacuum.

- All components should be compatible to use with specified refrigerants according to Optyma™ Slim Pack condensing unit codes. Refer to Annex A.
- Optyma™ Slim Pack condensing units have pre-ventilation via a condenser fan before the compressor starts (30 seconds). Never disconnect or modify timer settings.
- Beware of hot and extremely cold components.
- Beware of moving components. The power supply should be disconnected while servicing.
- Danfoss always recommends to main IP54 electrical box. In case of any damage to the rubber gasket, the customer should replace it immediately.
- The compressor has an Internal overload protector (OLP). It will protect compressor pressure going beyond 32 bar pressure.
- No valves and detachable joints shall be located in areas accessible to the general public except when they comply with EN 16084
- Refrigerant piping shall be protected or enclosed to avoid damage.
- Field piping should be installed such that it will be free from a corrosive or salty environment to avoid corrosion in copper /Aluminum piping.
- In the case of fire incidence, pressure increases due to an increase in temperature at the receiver. Hence it is very important to install the PRV.

Filling the system

- Before filling the refrigerant into the Optyma™ Slim Pack condensing unit wear appropriate Personal Protective Equipment (PPE).
- Never start the compressor under vacuum. Keep the compressor switched off.
- If additional oil is required please refer to the compressor’s label for the type of oil. Check the Compressor application guideline for minimum oil level limit before refilling.
- Use only the refrigerant for which the unit is designed. Check the unit nameplate for more details.
- For glide refrigerants such as R454C, R455A, R448A, R449A, and R452A use a liquid valve in the refrigerant cylinder to charge.
- Fill the refrigerant in the liquid phase into the condenser or liquid receiver. Ensure a slow charging of the system to 4 – 5 bar for R448A, R449A, R452A, R407A, R407F, R507, R404A, R454C or R455A and approx. 2 bar for R134a, R513A. R1234yf.
- Do not put liquid refrigerant through the suction line.
- It is not allowed to mix additives with the oil and/or refrigerant. The remaining charge is done until the installation has reached a level of stable nominal condition during operation.
- Never leave the filling cylinder connected to the circuit.
- When charging A2L refrigerant make sure that the charging area is well ventilated
- The Liquid receiver is fitted with a Rotolock Valve for service purposes. As a factory setting, the valve will be in the completely OPEN position. During maintenance and Pump down, the Valve must be Rotated in a Clockwise direction until it is in the completely CLOSED position.
- Suction, Liquid valves, and Receiver Rotolock valves as Schrader ports for service operations like Gas Charging, and pressure measurement.

Verification before commissioning

- Use safety devices such as safety pressure switch and mechanical relief valve (not supplied) in compliance with both International and local applicable regulations and safety standards. Ensure that they are operational and properly set.
- Check that the settings of high-pressure switches and relief valves don’t exceed the maximum service pressure of any system component.
- Verify that all electrical connections are properly fastened and in compliance with international and local regulations.
- When a crankcase heater is required, it must be energized at least 12 hours before initial start-up and start-up after a prolonged shut-down period.
- The crankcase heater must be firmly fixed with a compressor shell. Ensure that it does not fall.
- The electrical panel door must be firmly closed using the knob in the door panel. For the W09 version only, the front door of the Electrical box is fastened by 4 screws on each corner.
- All interconnecting tubes with (liquid and suction) Optyma™ Slim pack condensing unit must be sized properly depending upon the evaporator location.
- Pressure drop in the suction and liquid line pipes must be evaluated as per evaporator location and distance (refer to coolselector2).
- Optyma™ Slim Pack condensing units’ suction/discharge pressure and temperatures must be within the operating envelope, never operate condensing unit suction pressure below absolute pressure (vacuum).

Start-up

- Never start the unit when no refrigerant is charged.
- All service valves must be in the open position. See picture 3.
- Check compliance between the unit and power supply.
- Check that the crankcase heater is working.
- Check that the fan can rotate freely.
- Check that the protection sheet has been removed from the backside of the condenser.
- Balance the HP/LP pressure.
- Energize the unit. The condenser fan must start promptly and after 30 30-second delay, the compressor starts (pre-ventilation).
- If the fan motor rotation direction is correct the low pressure indication on the low pressure gauge shall show a declining pressure and the high pressure indication on the high pressure gauge shall show an increasing pressure.
- Ensure you have read the installation guidelines that are delivered with the condensing unit
- Only use the correct refrigerant(s) as detailed on the data plate
- Check compressor oil level
- Check all mechanical connections are tight
- Check all electrical overload settings are correct (See Annex D – Wiring Drawing).

Check with the running unit

- Check the fan rotation direction. Air must flow from the condenser towards the fan.
- Check the current drawn and voltage.
- Check suction superheat to reduce the risk of liquid slugging.

- For glide refrigerants use temperature difference between saturated dew point at suction pressure and Suction line temperature on the tube.
- When a compressor sight glass is provided observe the oil level at the start and during operation to confirm that the oil level remains visible.
- Respect the operating limits.
- Optyma™ Slim Pack condensing units are designed to operate up to 43°C. During normal operation or peak operation, saturated dew point condensing temperature is not to exceed corresponding to 63 °C for R448A, R449A, R452A, R454C, and R455A. Saturated dew point condensing temperature not to exceed corresponding to 65 °C for R134a, R513A & R1234yf.
- Check all interconnecting tubes are free from abnormal vibrations. If in case of excess vibrations, require corrective measures such as supporting brackets, and clamps.
- When needed, additional refrigerant in the liquid phase may be added on the low-pressure side as slowly and far away as possible from the compressor. The compressor must be operating during this process.
- Do not overcharge the system.
- Follow the local regulations for restoring the refrigerant from the unit.
- Never release refrigerant to the free atmosphere.
- Before leaving the installation site, carry out a general installation inspection regarding cleanliness, noise, and leak detection.
- Record the type and amount of refrigerant charge as well as operating conditions as a reference for future inspections.
- Check refrigerant charge and running currents of motors to ensure correct operation
- Check compressor suction superheat to reduce the risk of liquid slugging
- Allow the system to run for 3 – 4 hours. Check the compressor oil level and top up with the correct oil type as identified on the data plate of the unit and compressor
- Recheck the compressor oil level after 24 hours of operation
- Carry out final leak test and ensure all covers are fitted and all screws fastened
- Complete refrigerant labeling to comply with local standards.
- Scroll Compressors are allowed to Operate at a maximum of 12 Start/Stop cycles per hour.
- Reciprocating Compressors are allowed to Operate at a maximum of 10 Start/Stop cycles per hour.
- Ensure maintenance is carried out according to the installation instructions

Maintenance

- Always switch off the unit at the main switch before removing the fan panel.
- Internal pressure and surface temperature are dangerous and may cause permanent injury.
- Maintenance operators and installers require appropriate PPEs, skills, and tools to carry out the maintenance activity. Tubing temperature may exceed 100°C and can cause severe burns.
- Ensure that periodic service inspections to ensure system reliability and as required by local regulations are performed.

To prevent system-related problems, the following periodic maintenance is recommended:

- Verify that safety devices are operational and properly set.
- Ensure that the system is leak-tight.

- Check the compressor current draw.
- Confirm that the system is operating in a way consistent with previous maintenance records and ambient conditions.
- Check that all electrical connections are still adequately fastened.
- Keep the unit clean and verify the absence of rust and oxidation on the unit components, tubes, and electrical connections.
- Micro channel heat exchanger surface adequately cleaned to avoid clogging.
- Timer settings are set at 30 seconds during normal running conditions.
- Optyma™ Slim Pack condensing units are factory-fitted with flare-type filter driers. While changing the filter drier ensure that proper model designation and direction of flow. Ensure to conduct the leakage check after replacement. The condenser must be checked at least once a year for clogging and be cleaned if deemed necessary. Access to the internal side of the condenser takes place through the fan panel. Microchannel coils tend to accumulate dirt on the surface rather than inside, which makes them easier to clean than fin-and-tube coils.
- Switch off the unit at the main switch before removing any panel from the condensing unit.
- All electrical equipment, PPEs, and tools must be compatible and approved to use with A2L refrigerants like R454C, R455A & R1234yf.
- Remove surface dirt, leaves, fibers, etc. with a vacuum cleaner, equipped with a soft brush or other soft attachment. Alternatively, blow compressed air through the coil from the inside out, and brush with a soft bristle. Do not use a wire brush. Do not impact or scrape the coil with the vacuum tube or air nozzle.
- If the refrigerant system has been opened, the system has to be flushed with dry air or nitrogen to remove moisture and a new filter drier has to be installed. If evacuation or recovery of refrigerant has to be done, it shall be done in such a way that no refrigerant can escape to the environment.

Service panel removal procedure for W05 Version.

Step 1: Make sure that the power supply has been disconnected.

Step 2: Remove all top panel screws and then remove the Top panel.

Step 3: Remove all side panel screws.

- Step 4: Remove the side panel parallel to the main switch.
- Step 5: The electrical panel box should be in closed condition. Ensure there is no refrigerant penetration inside the Electrical panel before connecting it to the power supply.

Service panel removal procedure for W09 Version.

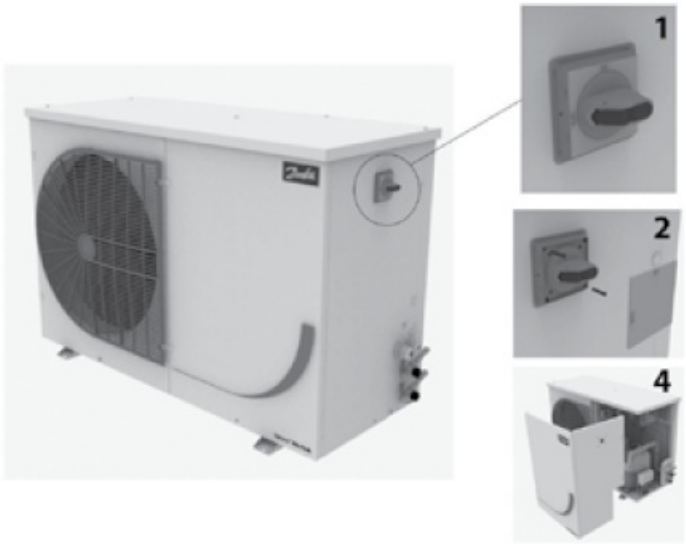
Step 1: Disconnect the power supply. Make sure the main switch is in off condition before servicing.

Step 2: Remove all top panel screws and then remove the Top panel.

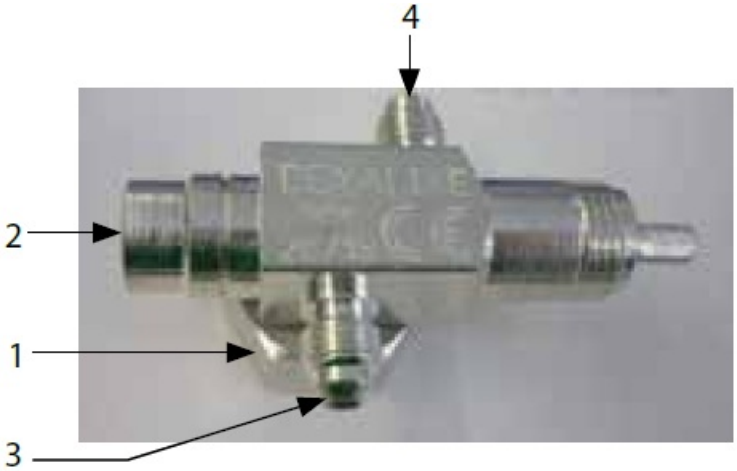
Step 3: Remove all side panel screws.

- Step 4: Remove the side panel parallel to the main switch.
- Step 5: The electrical panel box should be in closed condition. Ensure there is no refrigerant penetration inside the Electrical panel before connecting it to the power supply.

Service panel removal procedure for W09 Version.



- Step 1: Pull the cap from the isolator switch using screwdriver.
- Step 2: Unscrew the isolator switch from the service panel.
- Step 3: Take out the isolator switch.
- Step 4: Removing the service panel.



  - 1. Valve inlet
  - 2. Valve outlet
  - 3, 4. Service port

Valve Fully Closed (Valve spindle entirely turned clockwise)

- 1,3 and 4 Connected
- 2 has not connection to other ports

The valve opened some turns (valve spindle somewhere between opening & close)

- 1,2, 3 and 4 Connected

Valve Fully Opened (Valve spindle entirely turned anti-clockwise)

- 1,2 and 3 Connected
- 4 has not connection to other ports

Spindle completely closed

Spindle completely opened

Declaration of incorporation

Pressure Equipment Directive 2014/68/EU

- EN 378-2:2016 – Refrigerating systems and Heat Pumps – Safety and environmental requirements Parts 2: Design, construction, testing, marking, and documentation
  Low Voltage Directive 2014/35/EU EN 60335- 1:2012 + A11:2014- Household and similar electrical appliances-Safety-Part 1: General requirements for all above-mentioned condensing units

- Eco-design DIRECTIVE 2009/125/ EC, establishing a framework for the setting of Ecodesign requirements for energy-related products. REGULATION (EU) 2015/1095, implementing Ecodesign Directive 2009/125/EC about Ecodesign requirements for professional refrigerated storage cabinets, blast cabinets, condensing units and process Chiller.
    - Condensing unit measurements are produced according to standard “EN 13771-2:2017”. Compressor and condensing units for refrigeration-performance testing and test methods- part 2: Condensing units.
    - Eco design declaration; refer Danfoss Coolselector®2 with code number (114X….) to find the declaration.
    - IEC 60335-2-40 applicable clauses Annex JJ and Annex NN

Warranty

Always transmit the model number and serial number with any claim filed regarding this product. The product warranty may be involved in the following cases:

- Absence of nameplate.
- External modifications; in particular, drilling, welding, broken feet, and shock marks.
- Compressor opened or returned unsealed.
- Rust, water, or leak detection dye inside the compressor.
- Use of a refrigerant or lubricant not approved by Danfoss.
- Any deviation from recommended instructions on installation, application, or maintenance.
- Use in mobile applications.
- Use in the explosive atmospheric environment.
- No model number or serial number was transmitted with the warranty claim.

Disposal
Danfoss recommends that condensing units and oil should be recycled by a suitable company at its site.

Dual Pressure switch – Factory settings

Refrigerants	High-pressure settings (bar (g))		Low-pressure settings (bar (g))	
	ON	OFF	ON	OFF
R404A/R507/R407A/R407F/R448A/R449A/R452A,R454C, R455A	23	27	2	0.6
R134a/R513A	13	17	2	0.6

Dual Pressure switch – Refrigerant setting

Refrigerants	High-pressure settings (bar (g))		Low-pressure settings (bar (g))	
	ON	OFF	ON	OFF
R134a, R513A, R1234yf	14	17	2	0.6
R404A/R507, R452A	24	27	2	0.6
R454C	19	23	2	0.6
R455A	21	25	2	0.6
R448A/R449A	22	26	2	0.6

Fan speed controller setting – AC Fan Motor (B1 & B2 Chassis models)

FSC type	Fan speed Controller Spare part number	Refrigerant letter	For Refrigerant	Factory setting	Action required*
 XGE-2C	061H3144	S	R134a/R513A/R1234yf	8 bar	360°=1 turn = Approx 0.8 bar (Clockwise rotation = Increase pressure setting, Counter clockwise rotation = Decrease pressure setting)
	061H3248	V	R404A/R452A/R507	15 bar	
		X	R404A/R507/ R407A/R407F/R448A/ R449A/R452A (Except R134a and R513A)	15 bar	
		T	R404A / R507, R455A, R454C, R448A/ R449A, R452A	15 bar	
		I	R404A / R507, R407A, R407F, R448A, R449A, R452A, R454C, R455A (Except R134a and R513A)	15 bar	Rotate the screw by 9 turns in counter-clockwise direction to reach 8 bar

The installer can set the required settings based on the application.

Fan speed controller setting EC Fan Motor (B3, W09)

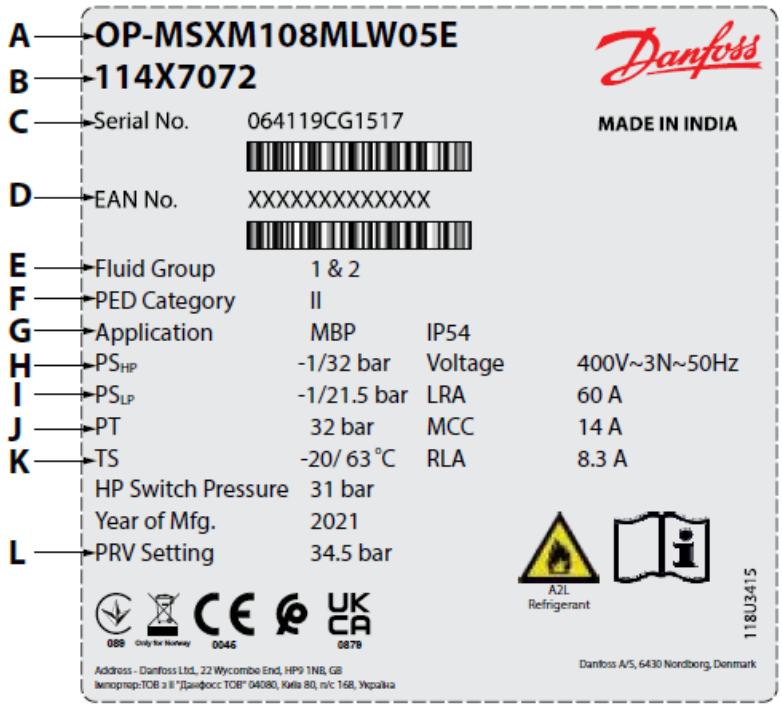
FSC type	Fan speed Controller Spare part number	Refrigerant letter	For Refrigerant	Factory setting	Recommended setting	Action required*
 XGE-4C	061H3246	I	R134a/R513A	15 bar	10 bar	Rotate the screw by 3 turns in counter-clockwise direction to reach 10 bar
			R404A / R507, R407A, R407F, R448A, R449A, R452A, R454C, R455A	15 bar	15 bar	
XGE-4C						

The installer can set the required settings based on the application.

Clockwise Direction = Increase the pressure setting. Counter Clockwise Direction = Decrease the pressure setting

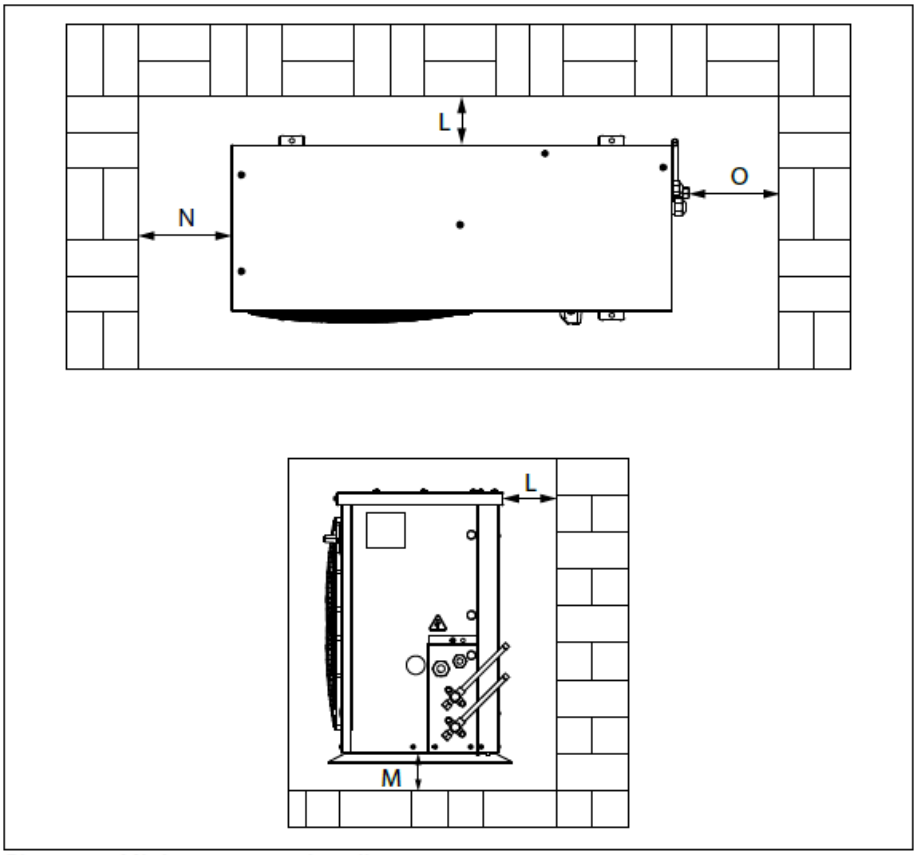
Technical Data

Nameplate



For exact values please refer nameplate in unit

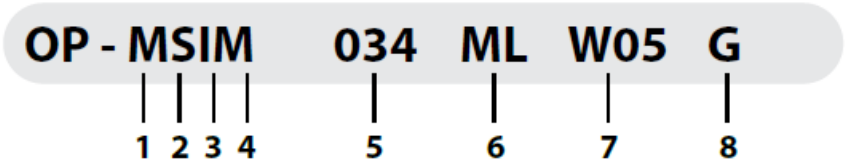
- **A:** Model
- **B:** Code number
- **C:** Serial Number and barcode
- **D:** EAN number
- **E:** Refrigerant
- **F:** PED Category
- **G:** Application, Ingress Protection
- **H:** Maximum Allowable Pressure (HP side)
- **I:** Maximum Allowable Pressure (LP side)
- **J:** Test Pressure
- **K:** Maximum allowable Design Temperature
- **L:** Pressure Relief Valve set pressure



Picture 1 : Minimum mounting distances

L [mm]	M [mm]	N [mm]	O [mm]
250	50	550	550

Designation system for the Optyma™ Slim Pack range

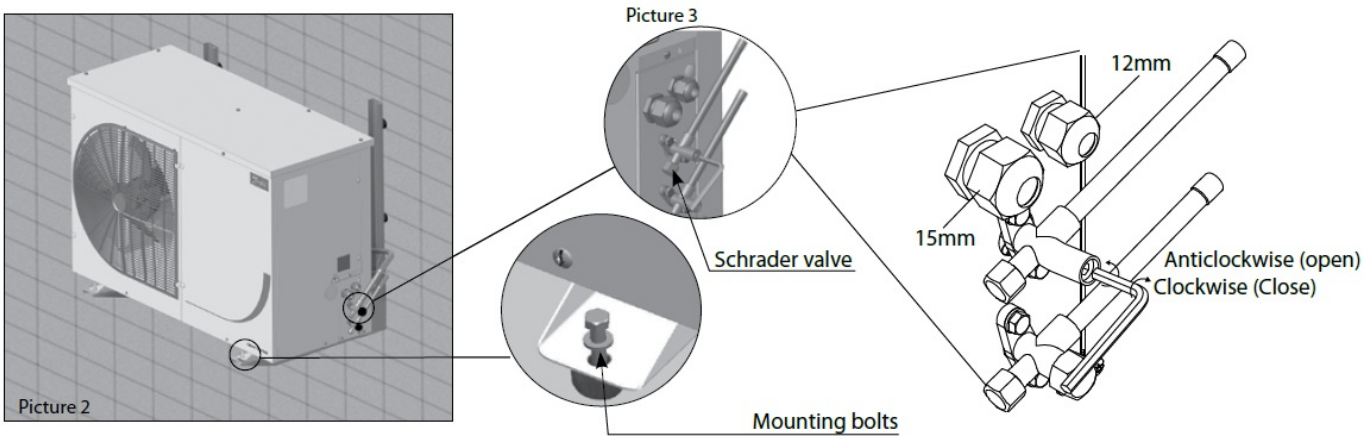


1	**Application** M = MBP L = LBP
2	**Package** Condensing unit family: S = Slim Pack
3	**Refrigerant** T = R404A/R507, R455A, R454C, R448A/R449A, R452A S = R134a, R513A, R1234yf V = R454C, R455A, R452A, R404A/R507 X = R404A / R507, R134a, R407A, R407F, R448A, R513A, R449A, R452A I = R404A / R507, R134a, R407A, R407F, R448A, R513A, R449A, R452A, R454C, R455A
4	**Condenser** M = Microchannel heat condenser
5	**Swept volume** Displacement in $cm^{3:}$ Example 034 = 34 cm^3
6	**Compressor platform** DP/DX/DS = Fixed speed Reciprocating compressor MP/MX/MS = Fixed speed Reciprocating compressor, ML = Scroll compressor
7	**Version** W05: Optyma™ Slim Pack standard version (see Version table) W09: Optyma™ Slim Pack with Fan Speed Controller
8	**Voltage code** G = 230V/1-phase compressor & fan E = 400V/3-phase compressor & 230V/1-phase fan

Version control

Optyma™ **Slim Pack**	**W05***	**W09***
Condensing unit: IP level	IP54	IP54
Refrigerant	Group 1 / Group 2	Group 1 / Group 2
Compressor technology	Reciprocating / Scroll	Reciprocating / Scroll
Control box (pre-wired E-panel)	yes	yes
Microchannel condenser	yes	yes
Fan speed controller	–	yes
Main switch (circuit breaker)	–	yes
Filter drier (flare connections)	yes	yes
Sight glass	yes	yes
Crankcase heater	yes	yes
HP/LP adjustable press start	Auto/Manual reset mode	Auto/Manual reset mode
Access door(s)	yes for E-Box	yes for E-Box
Acoustic insulation	Provided as an accessory. Not supplied with the unit.	
Discharge gas thermostat (Provision)	yes	yes
HP/LP Alarm (Provision)	yes	yes
Electrical Box design	IP54	IP54
Adjustable time delay (Compressor)	yes	yes
Pressure Relief Valve**	–	–

- * Compatible with A2L refrigerant
- ** Accessory (Not factory mounted)



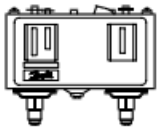
Technical data

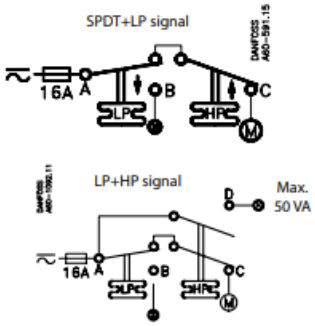
Application	Codes		Model	Compressor Model	Electrical Code	Refrigerant	Rec ei-ver (L)	PED category*	PS	Suction Valve	Liquid Valve	Hou - si ng	Unit Dimensions (mm)		
	W05	W09							bar	Inch	Inch		H	W	L
LBP	114X7263	114X7295	OP-LSVM014DP	DPT14LA	G	V	1.3	I	32	3/8″	3/8″	B1	530	910	364
	114X7242	114X7296	OP-LSVM016DP	DPT16LA	G	V	1.3	I	32	3/8″	3/8″	B1	530	910	364
	114X7227	114X7297	OP-LSVM026DS	DST26NA	G	V	3.4	II	32	1/2″	1/2″	B2	690	1079	464
	114X7228	114X7298	OP-LSVM034DS	DST34LA	G	V	3.4	II	32	1/2″	1/2″	B2	690	1079	464
	114X7244	114X7282	OP-LSVM048NT	NTZ048-5	G	V	3.4	II	32	5/8″	1/2″	B2	690	1079	464
	114X7245	114X7283	OP-LSVM048NT	NTZ048-4	E	V	3.4	II	32	5/8″	1/2″	B2	690	1079	464
	114X7247	114X7285	OP-LSVM068NT	NTZ068-5	E	V	3.4	II	32	5/8″	1/2″	B2	690	1079	464
	114X7226	114X7286	OP-MSTM008DY	DLY80RAb	G	T	1.3	I	32	3/8″	3/8″	B1	530	910	364
	114X7229	114X7287	OP-MSTM009DY	DLY90RAb	G	T	1.3	I	32	3/8″	3/8″	B1	530	910	364
	114X7230	114X7288	OP-MSTM012DP	DPT12RA	G	T	1.3	I	32	3/8″	3/8″	B1	530	910	364
	114X7238	114X7291	OP-MSSM012SC	SC12G	G	S	1.3	I	32	3/8″	3/8″	B1	530	910	364
	114X7231	114X7289	OP-MSTM014DP	DPT14RA	G	T	1.3	I	32	3/8″	3/8″	B1	530	910	364
	114X7239	114X7292	OP-MSSM015SC	SC15G	G	S	1.3	I	32	3/8″	3/8″	B1	530	910	364
	114X7232	114X7290	OP-MSTM018DX	DX18Tba	G	T	1.3	I	32	3/8″	3/8″	B1	530	910	364
	114X7240	114X7293	OP-MSSM018SC	SC18G	G	S	1.3	I	32	3/8″	3/8″	B1	530	910	364
	114X7325	114X7327	OP-MSTM021DX	DX21Tba	G	T	3.4	II	32	1/2″	1/2″	B2	690	1079	464
	114X7241	114X7294	OP-MSSM021SC	SC21G	G	S	1.3	I	32	3/8″	3/8″	B1	530	910	364
	114X7233	114X7299	OP-MSTM022DS	DS22TB	G	T	3.4	II	32	1/2″	1/2″	B2	690	1079	464

MBP	114X7248	114X7304	OP-MSSM026CS	CS26TB	G	S	3.4	II	32	1/2″	1/2″	B2	690	1079	464
	114X7234	114X7300	OP-MSTM026DS	DS26TB	G	T	3.4	II	32	1/2″	1/2″	B2	690	1079	464
	114X7235	114X7301	OP-MSTM026DS	DS26T3	E	T	3.4	II	32	1/2″	1/2″	B2	690	1079	464
	114X7249	114X7305	OP-MSSM030CS	CS30TB	G	S	3.4	II	32	1/2″	1/2″	B2	690	1079	464
	114X7237	114×7302	OP-MSTM034DS	DS34TB	G	T	3.4	II	32	1/2″	1/2″	B2	690	1079	464
	114X7236	114X7303	OP-MSTM034DS	DS34T3	E	T	3.4	II	32	1/2″	1/2″	B2	690	1079	464
	114X7266	114X7274	OP-MSIM034ML	MLZ015T4	E	I	3.4	II	32	3/4″	1/2″	B2	690	1079	464
	114X7267	114X7275	OP-MSIM034ML	MLZ015T5	G	I	3.4	II	32	3/4″	1/2″	B2	690	1079	464
	114X7326	114X7328	OP-MSTM038DS	DST38NA	G	T	3.4	II	32	1/2″	1/2″	B2	690	1079	464
	114X7268	114X7276	OP-MSIM044ML	MLZ019T4	E	I	3.4	II	32	3/4″	1/2″	B2	690	1079	464
	114X7269	114X7277	OP-MSIM044ML	MLZ019T5	G	I	3.4	II	32	3/4″	1/2″	B2	690	1079	464
	114X7270	114X7278	OP-MSIM046ML	MLZ021T4	E	I	3.4	II	32	3/4″	1/2″	B2	690	1079	464
	114X7271	114X7279	OP-MSIM046ML	MLZ021T5	G	I	3.4	II	32	3/4″	1/2″	B2	690	1079	464
	114X7272	114X7280	OP-MSIM057ML	MLZ026T4	E	I	3.4	II	32	3/4″	1/2″	B2	690	1079	464
	114X7273	114X7281	OP-MSIM057ML	MLZ026T5	G	I	3.4	II	32	3/4″	1/2″	B2	690	1079	464
	114X7311	114X7317	OP-MSIM068ML	MLZ030T4	E	I	6.2	II	32	7/8″	1/2″	B3	464	1105	825
	114X7312	114X7318	OP-MSIM068ML	MLZ030T5	G	I	6.2	II	32	7/8″	1/2″	B3	464	1105	825
	114X7313	114X7319	OP-MSIM080ML	MLZ038T4	E	I	6.2	II	32	7/8″	1/2″	B3	464	1105	825
	114X7314	114X7320	OP-MSIM080ML	MLZ038T5	G	I	6.2	II	32	7/8″	1/2″	B3	464	1105	825
	114X7315	114X7321	OP-MSIM099ML	MLZ045T4	E	I	6.2	II	32	7/8″	1/2″	B3	464	1105	825
	114X7316	114X7322	OP-MSIM108ML	MLZ048T4	E	I	6.2	II	32	7/8″	1/2″	B3	464	1105	825

KP switch settings

KP17WB





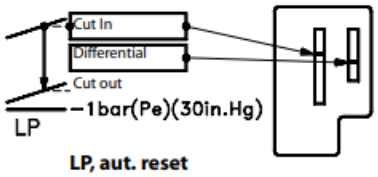
Listed refrigeration controller 61B5

Contacts	Voltage AC	Voltage DC	FL A	LR A	Resist. Load	Pilot duty
A-B	240		8	48	8A	3A
A-C	120		16	96	16A	
		240				12W
A-D	240					50VA

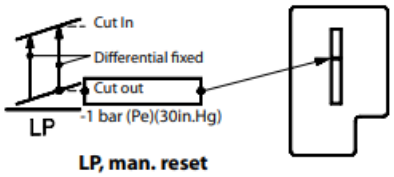
Use Copper wire only
Tightening torque 20lb.in.

When used acc. to UL regulations

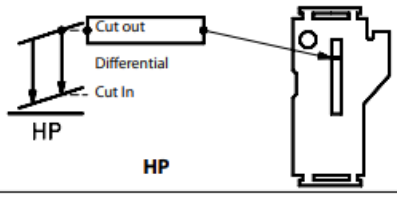
LR 112A	AC1 10A AC3 10A AC11 10A	400 V	DC 11 12 W 220 V



LP, aut. reset

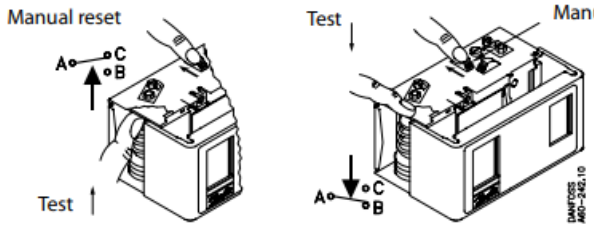


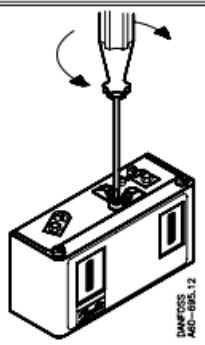
LP, man. reset



HP

Manual test



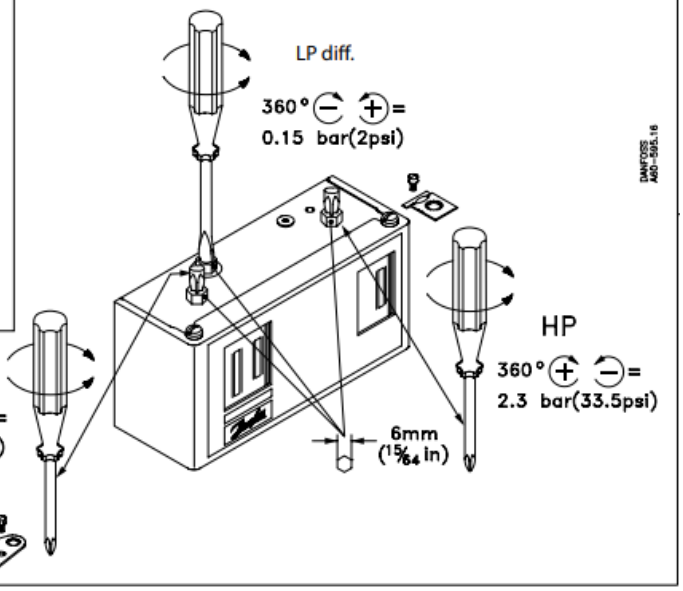


Convertible reset

KP 17B 060-539366, 060-539466

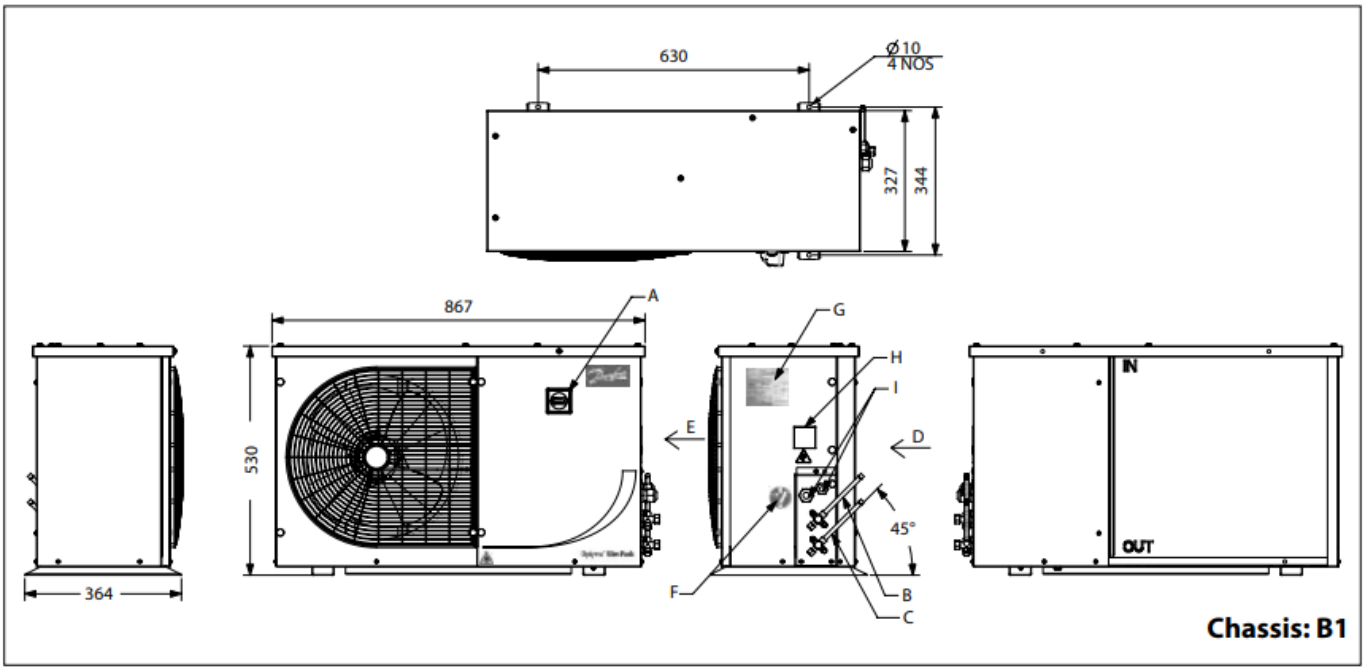
LP-auto.
HP-man.

LP-auto.
HP-auto.

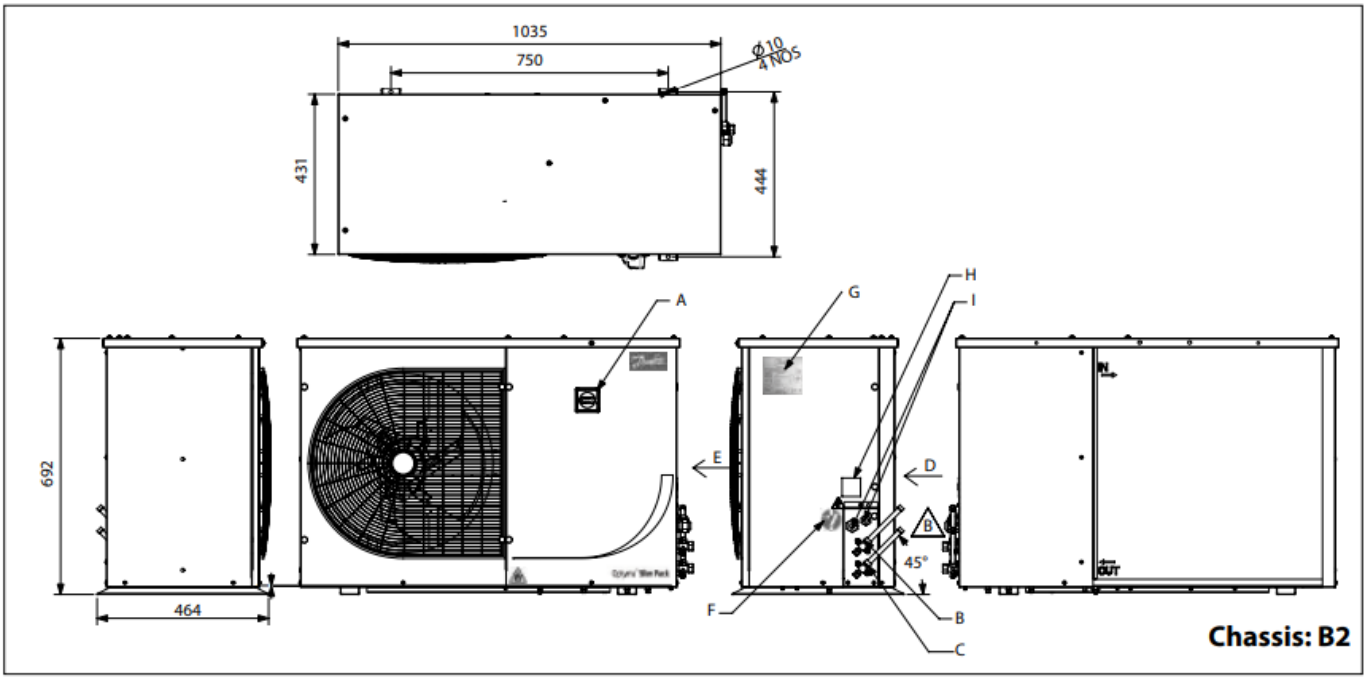


GA & PID Drawings

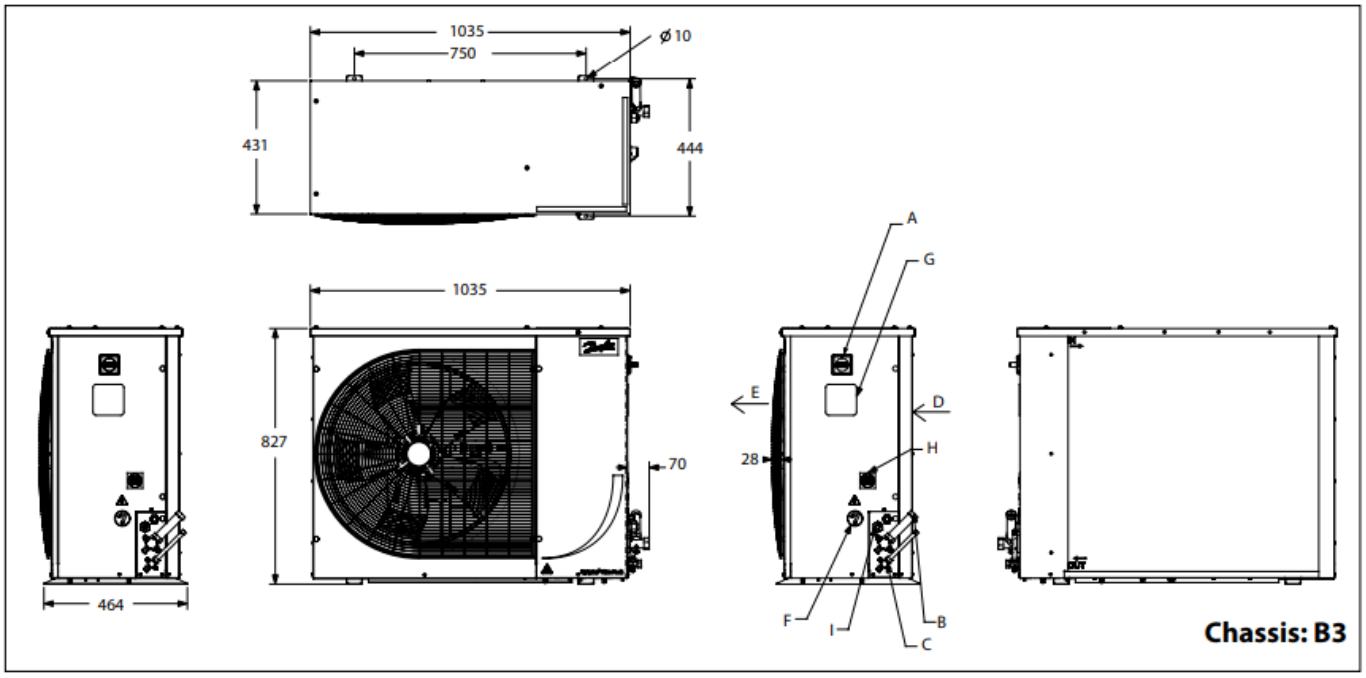
OP-LSVM, MSTM, MSSM and MSIM



Chassis: B1



Chassis: B2



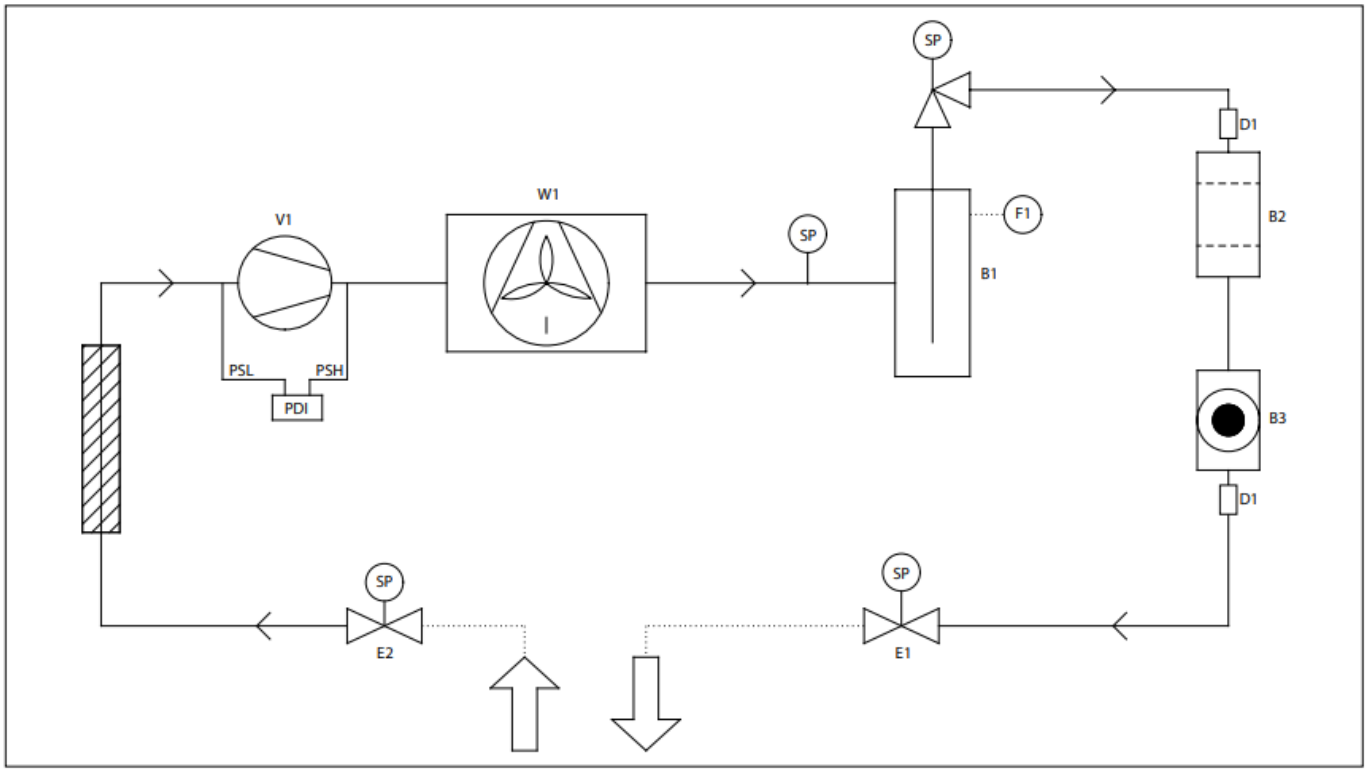
Chassis: B3

Legend

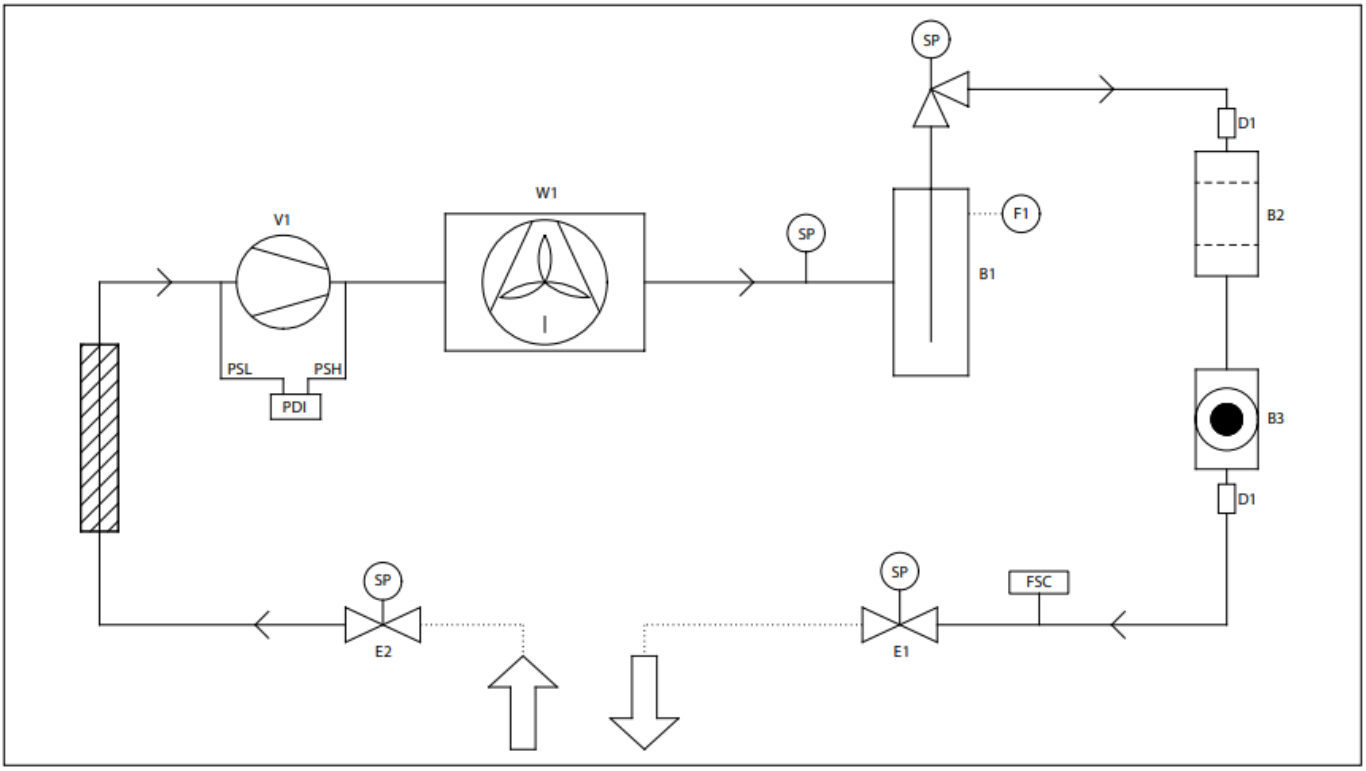
- **A.** Isolator Switch (W09 only)
- **B.** Suction Valve
- **C.** Liquid Valve
- **D.** Air in
- **E.** Air out
- **F.** Door safety Label
- **G.** Name Plate
- **H.** Oil inside
- **I.** Cable entry
    - Electrical Cables

Note: all dimensions are in mm.

W05 Models: OP-LSVM, MSTM, MSSM and MSIM



W09 Models: OP-LSVM, MSTM, MSSM and MSIM

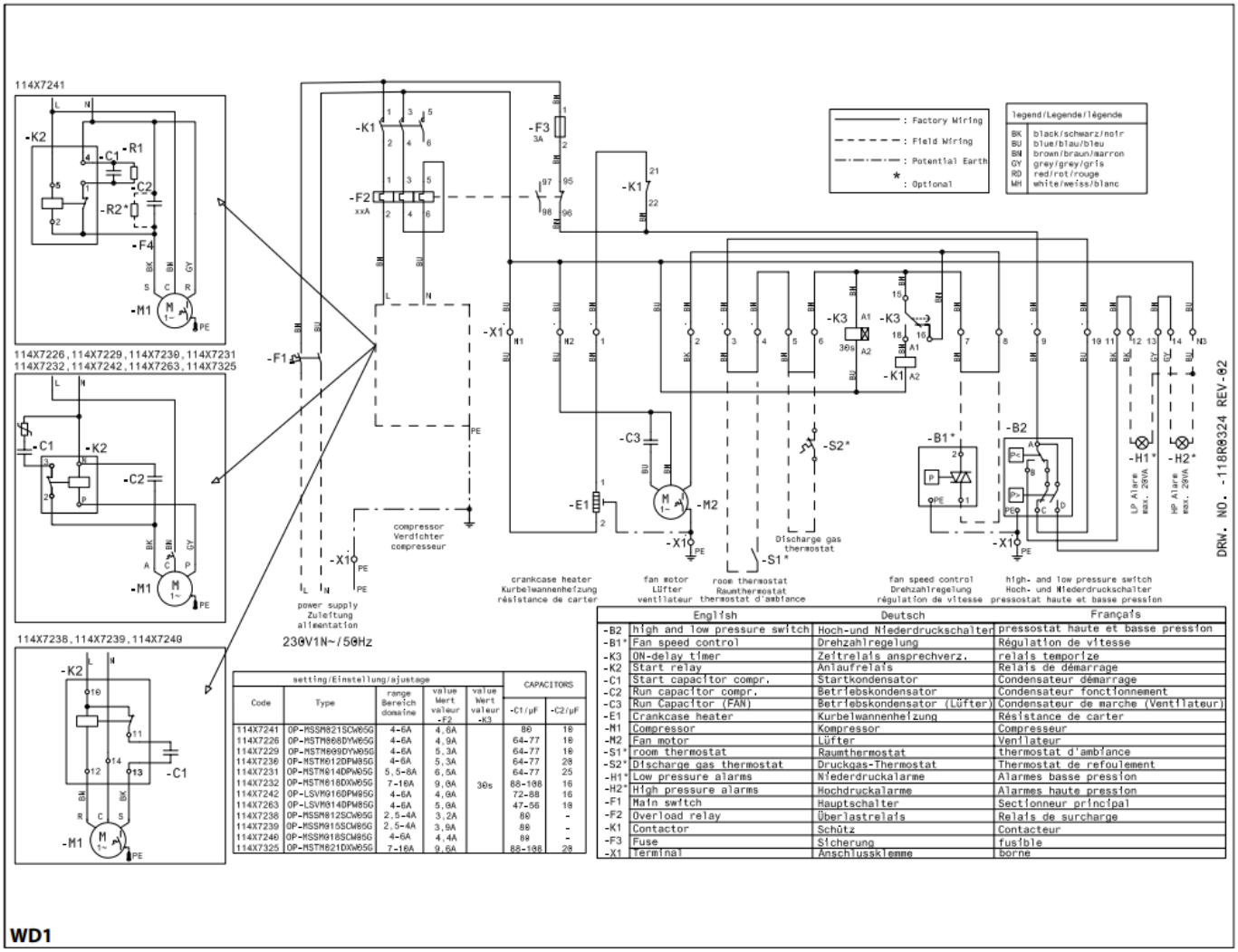


Legend

- B1 Liquid receiver
- B2 Filter drier (Flare)
- B3 Sight glass (Flare)
- D1 FSA connection (Flare)
- E1 Liquid service valve
- E2 Suction service valve
- F1 Pressure Relief Valve
- FSC Fan Speed Controller
- SP 1/4 inch Schrader port
- PDI Dual pressure switch
- V1 Recip compressor
- W1 MHCE with fan
- PSL Low-Pressure side
- PSH High-Pressure side
    - Insulation

Wiring Diagram

Code G (W05): OP-MSSM021,OP-MSTM008,009,012,014,018,021,OP-LSVM016,014,OP-MSSM012,015,018

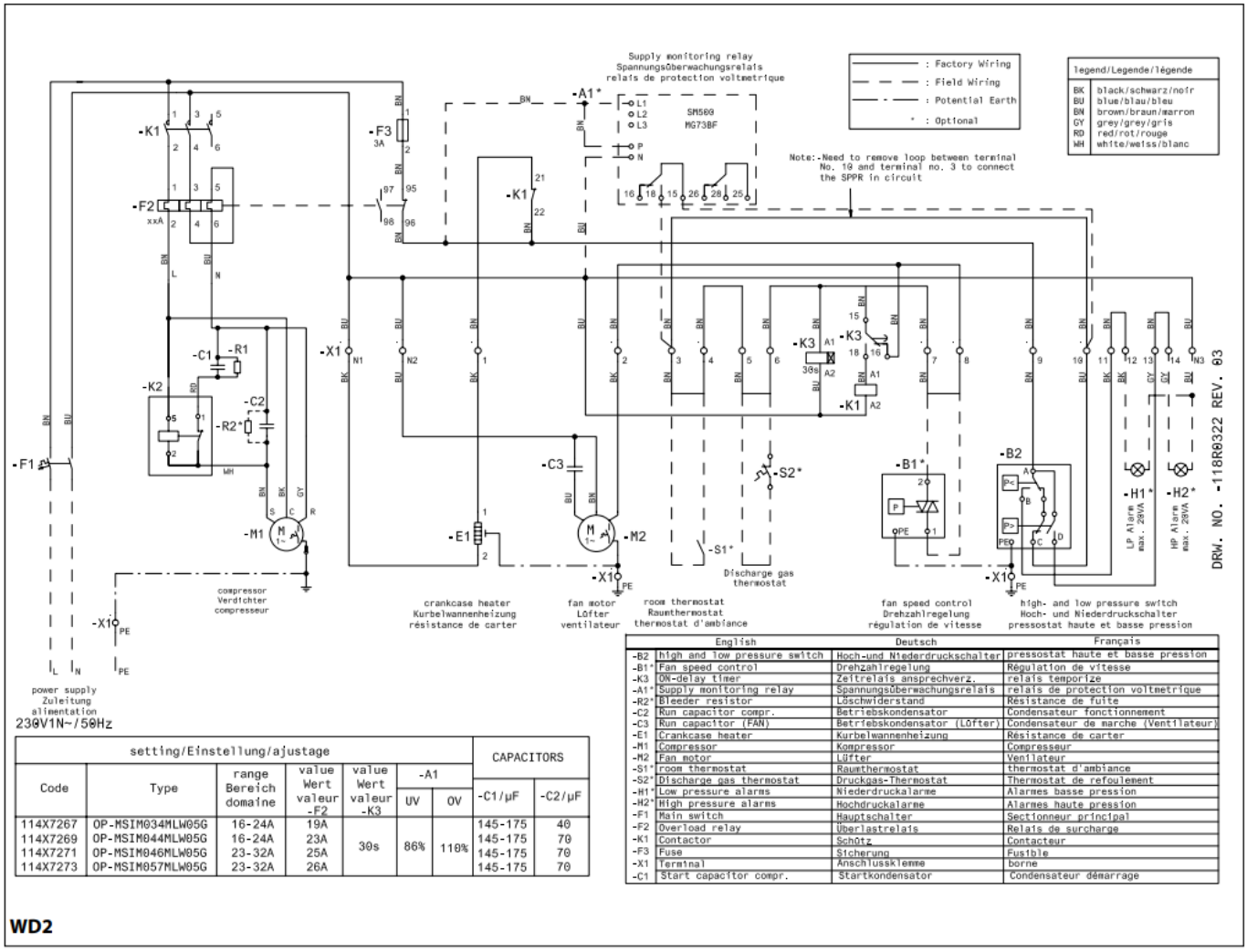


setting/Einstellung/ajustage					CAPACITORS	
Code	Type	range Bereich domaine	value Wert valeur -F2	value Wert valeur -K3	-C1/µF	-C2/µF
114X7241	OP-MSSM021SCW05G	4-6A	4,6A		80	10
114X7226	OP-MSTM068DYW05G	4-6A	4,9A		64-77	10
114X7229	OP-MSTM069DYW05G	4-6A	5,3A		64-77	10
114X7236	OP-MSTM012DPW05G	4-6A	5,3A		64-77	20
114X7231	OP-MSTM014DPW05G	5,5-8A	6,5A		64-77	25
114X7232	OP-MSTM018DXW05G	7-10A	9,0A	30s	88-108	16
114X7242	OP-LSVM016DPW05G	4-6A	4,9A		72-88	16
114X7263	OP-LSVM014DPW05G	4-6A	5,0A		47-56	10
114X7238	OP-MSSM012SCW05G	2,5-4A	3,2A		80	-
114X7239	OP-MSSM015SCW05G	2,5-4A	3,9A		88	-
114X7240	OP-MSSM018SCW05G	4-6A	4,4A		88	-
114X7325	OP-MSTM021DXW05G	7-10A	9,6A		88-108	20

	English	Deutsch	Français
-B2	high and low pressure switch	Hoch-und Niederdruckschalter	pressostat haute et basse pression
-B1*	Fan speed control	Drehzahlregelung	Régulation de vitesse
-K3	ON-delay timer	Zeitrelais ansprechverz.	relais temporize
-K2	Start relay	Anlaufrelais	Relais de démarrage
-C1	Start capacitor compr.	Startkondensator	Condensateur démarrage
-C2	Run capacitor compr.	Betriebskondensator	Condensateur fonctionnement
-C3	Run Capacitor (FAN)	Betriebskondensator (Lüfter)	Condensateur de marche (Ventilateur)
-E1	Crankcase heater	Kurbelwannenheizung	Résistance de carter
-M1	Compressor	Kompressor	Compresseur
-M2	Fan motor	Lüfter	Ventilateur
-S1*	room thermostat	Raumthermostat	thermostat d'ambiance
-S2*	Discharge gas thermostat	Druckgas-Thermostat	Thermostat de refoulement
-H1*	Low pressure alarms	Niederdruckalarme	Alarmes basse pression
-H2*	High pressure alarms	Hochdruckalarme	Alarmes haute pression
-F1	Main switch	Hauptschalter	Sectionneur principal
-F2	Overload relay	Überlastrelais	Relais de surcharge
-K1	Contactor	Schütz	Contacteur
-F3	Fuse	Sicherung	fusible
-X1	terminal	Anschlussklemme	borne

WD1

Code G (W05) : OP-MSIM034,044,046,057

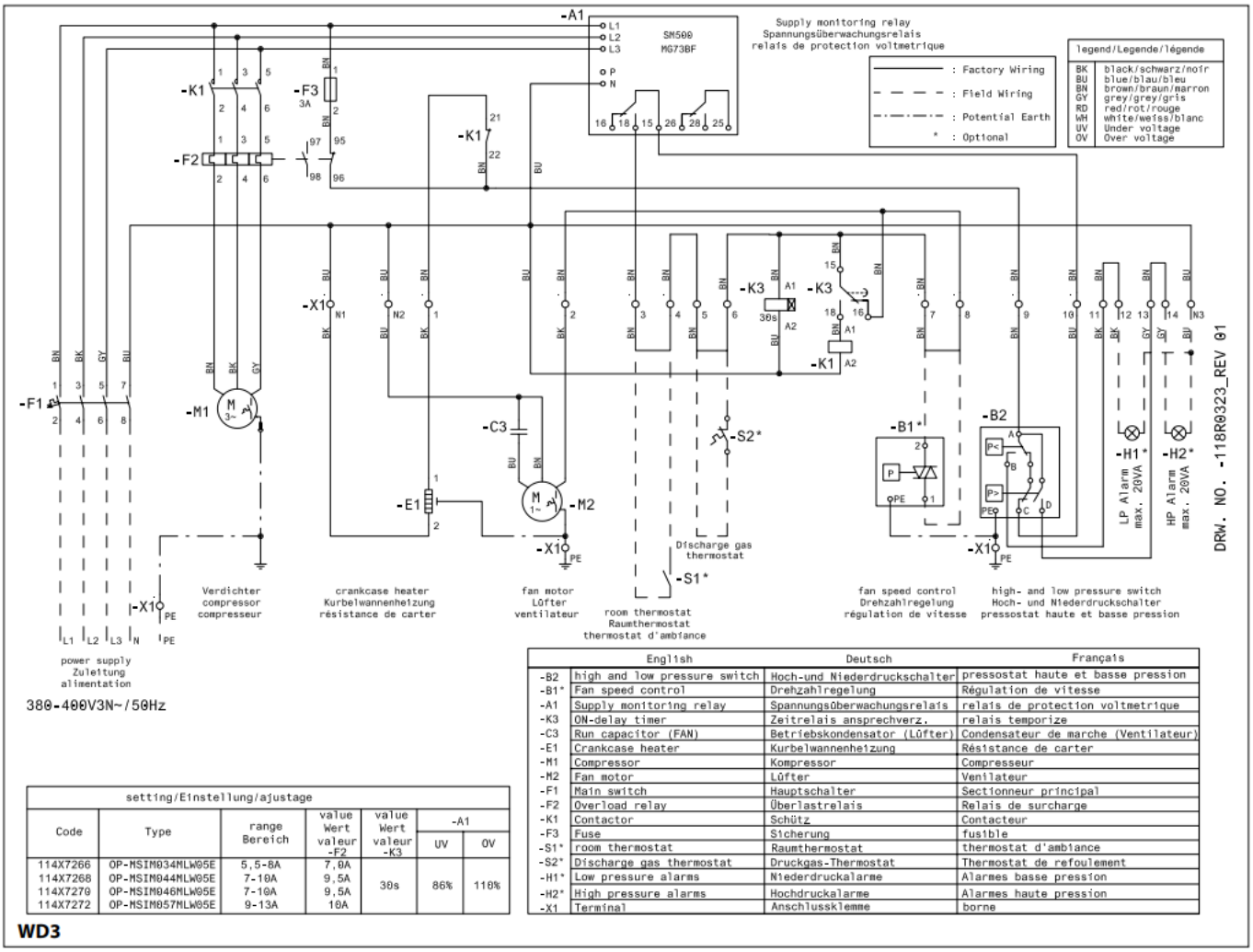


setting/Einstellung/ajustage							CAPACITORS	
Code	Type	range Bereich domaine	value Wert valeur -F2	value Wert valeur -K3	-A1 UV	-A1 OV	-C1/µF	-C2/µF
114X7267	OP-MSIM034MLW05G	16-24A	19A	30s	86%	110%	145-175	40
114X7269	OP-MSIM044MLW05G	16-24A	23A				145-175	70
114X7271	OP-MSIM046MLW05G	23-32A	25A				145-175	70
114X7273	OP-MSIM057MLW05G	23-32A	26A				145-175	70

	English	Deutsch	Français
-B2	high and low pressure switch	Hoch-und Niederdruckschalter	pressostat haute et basse pression
-B1*	Fan speed control	Drehzahlregelung	Régulation de vitesse
-K3	ON-delay timer	Zeitrelais ansprechverz.	relais temporize
-A1*	Supply monitoring relay	Spannungsüberwachungsrelais	relais de protection voltmetrique
-R2*	Bleeder resistor	Löschwiderstand	Résistance de fuite
-C2	Run capacitor compr.	Betriebskondensator	Condensateur fonctionnement
-C3	Run capacitor (FAN)	Betriebskondensator (Lüfter)	Condensateur de marche (Ventilateur)
-E1	Crankcase heater	Kurbelwannenheizung	Résistance de carter
-M1	Compressor	Kompressor	Compresseur
-M2	Fan motor	Lüfter	Ventilateur
-S1*	room thermostat	Raumthermostat	thermostat d'ambiance
-S2*	Discharge gas thermostat	Druckgas-Thermostat	Thermostat de refoulement
-H1*	Low pressure alarms	Niederdruckalarme	Alarmes basse pression
-H2*	High pressure alarms	Hochdruckalarme	Alarmes haute pression
-F1	Main switch	Hauptschalter	Sectionneur principal
-F2	Overload relay	Überlastrelais	Relais de surcharge
-K1	Contactor	Schütz	Contacteur
-F3	Fuse	Sicherung	Fusible
-X1	Terminal	Anschlussklemme	borne
-C1	Start capacitor compr.	Startkondensator	Condensateur démarrage

WD2

Code E (W05) : OP-MSIM034,044,046,057

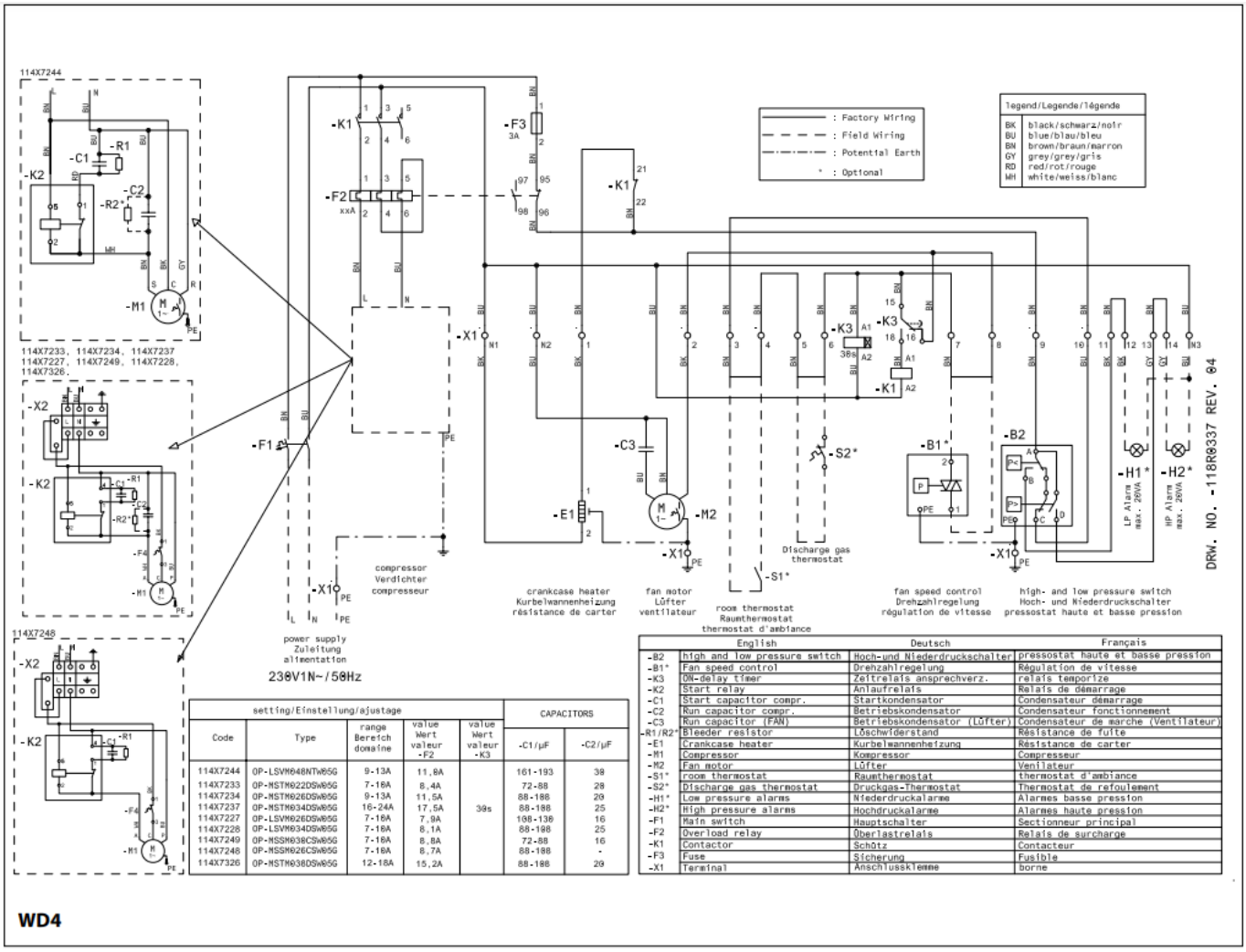


setting/Einstellung/ajustage						
Code	Type	range Bereich	value Wert valeur -F2	value Wert valeur -K3	-A1	
					UV	OV
114X7266	OP-MSIM034MLW05E	5,5-8A	7,0A	30s	86%	110%
114X7268	OP-MSIM044MLW05E	7-10A	9,5A			
114X7270	OP-MSIM046MLW05E	7-10A	9,5A			
114X7272	OP-MSIM057MLW05E	9-13A	10A			

	English	Deutsch	Français
-B2	high and low pressure switch	Hoch-und Niederdruckschalter	pressostat haute et basse pression
-B1*	Fan speed control	Drehzahlregelung	Régulation de vitesse
-A1	Supply monitoring relay	Spannungsüberwachungsrelais	relais de protection voltmetrique
-K3	ON-delay timer	Zeitrelais ansprechverz.	relais temporize
-C3	Run capacitor (FAN)	Betriebskondensator (Lüfter)	Condensateur de marche (Ventilateur)
-E1	Crankcase heater	Kurbelwannenheizung	Résistance de carter
-M1	Compressor	Kompressor	Compresseur
-M2	Fan motor	Lüfter	Ventilateur
-F1	Main switch	Hauptschalter	Sectionneur principal
-F2	Overload relay	Überlastrelais	Relais de surcharge
-K1	Contactor	Schütz	Contacteur
-F3	Fuse	Sicherung	fusible
-S1*	room thermostat	Raumthermostat	thermostat d'ambiance
-S2*	Discharge gas thermostat	Druckgas-Thermostat	Thermostat de refoulement
-H1*	Low pressure alarms	Niederdruckalarme	Alarmes basse pression
-H2*	High pressure alarms	Hochdruckalarme	Alarmes haute pression
-X1	Terminal	Anschlussklemme	borne

WD3

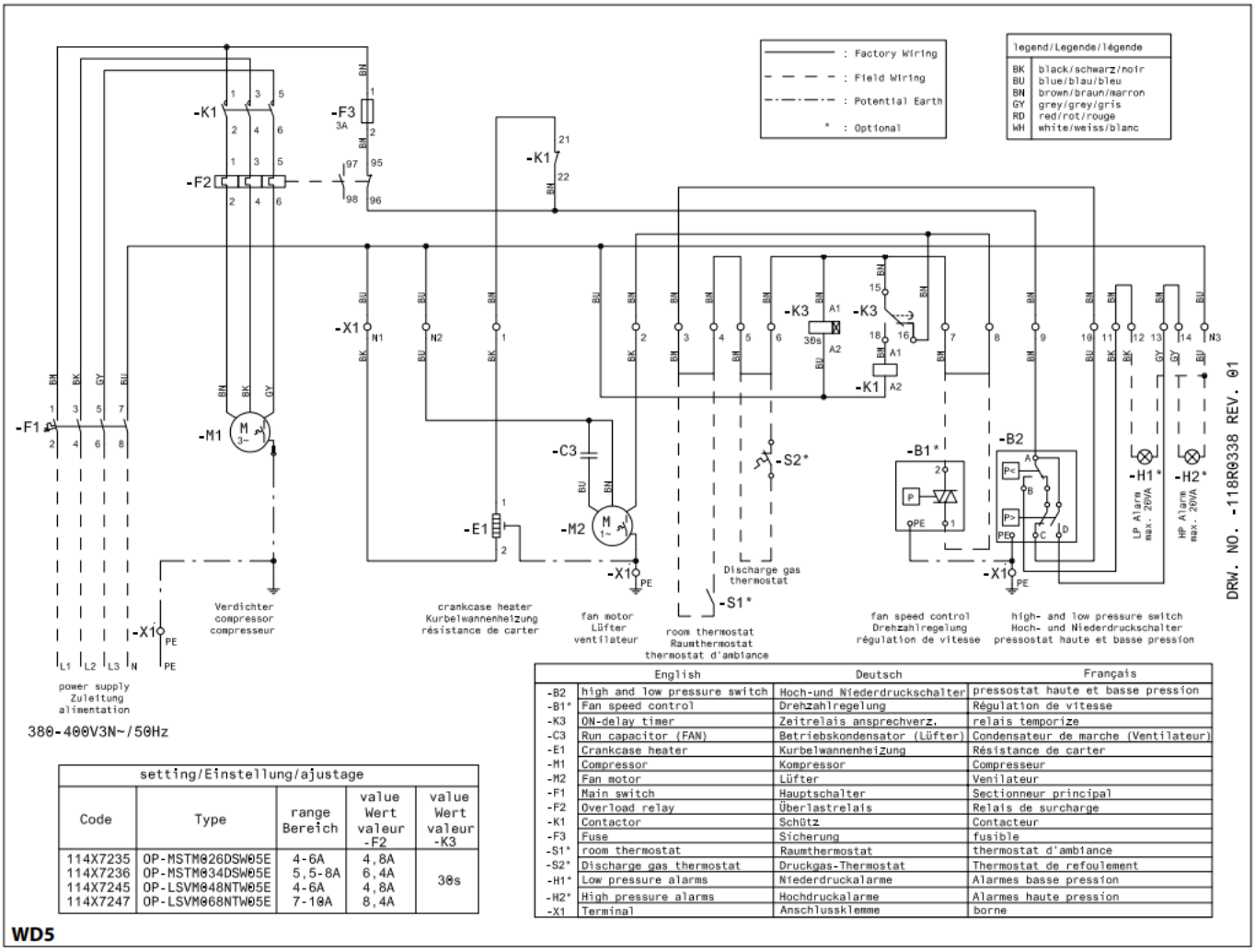
Code G (W05) : OP-LSVM048,068 & OP-MSTM022,026,034,038 & OP-LSVM026,034 & OP-MSSM030,026



setting/Einstellung/ajustage					CAPACITORS	
Code	Type	range Bereich domaine	value Wert valeur -F2	value Wert valeur -K3	-C1/µF	-C2/µF
114X7244	OP-LSVM048NTW05G	9-13A	11,8A		161-193	38
114X7233	OP-MSTM022DSW05G	7-10A	8,4A		72-88	28
114X7234	OP-MSTM026DSW05G	9-13A	11,5A		88-108	20
114X7237	OP-MSTM034DSW05G	16-24A	17,5A	30s	88-108	25
114X7227	OP-LSVM026DSW05G	7-10A	7,9A		108-136	16
114X7228	OP-LSVM034DSW05G	7-10A	8,1A		88-108	25
114X7249	OP-MSSM038CSW05G	7-10A	8,8A		72-88	16
114X7248	OP-MSSM026CSW05G	7-10A	8,7A		88-108	-
114X7326	OP-MSTM038DSW05G	12-18A	15,2A		88-108	20

	English	Deutsch	Français
-B2	high and low pressure switch	Hoch-und Niederdruckschalter	pressostat haute et basse pression
-B1*	Fan speed control	Drehzahlregelung	Régulation de vitesse
-K3	ON-delay timer	Zeitrelais ansprechverz.	relais temporize
-K2	Start relay	Anlaufrelais	Relais de démarrage
-C1	Start capacitor compr.	Startkondensator	Condensateur démarrage
-C2	Run capacitor compr.	Betriebskondensator	Condensateur fonctionnement
-C3	Run capacitor (FAN)	Betriebskondensator (Lüfter)	Condensateur de marche (Ventilateur)
-R1/R2*	Bleeder resistor	Löschwiderstand	Résistance de fuite
-E1	Crankcase heater	Kurbelwannenheizung	Résistance de carter
-M1	Compressor	Kompressor	Compresseur
-M2	Fan motor	Lüfter	Ventilateur
-S1*	room thermostat	Rauethermostat	thermostat d'ambiance
-S2*	Discharge gas thermostat	Druckgas-Thermostat	Thermostat de refoulement
-H1*	Low pressure alarms	Niederdruckalarme	Alarmes basse pression
-H2*	High pressure alarms	Hochdruckalarme	Alarmes haute pression
-F1	Main switch	Hauptschalter	Sectionneur principal
-F2	Overload relay	Überlastrelais	Relais de surcharge
-K1	Contactor	Schütz	Contacteur
-F3	Fuse	Sicherung	Fusible
-X1	Terminal	Anschlussklemme	borne

Code E (W05) : OP-MSTM026,034 & OP-LSVM048,068

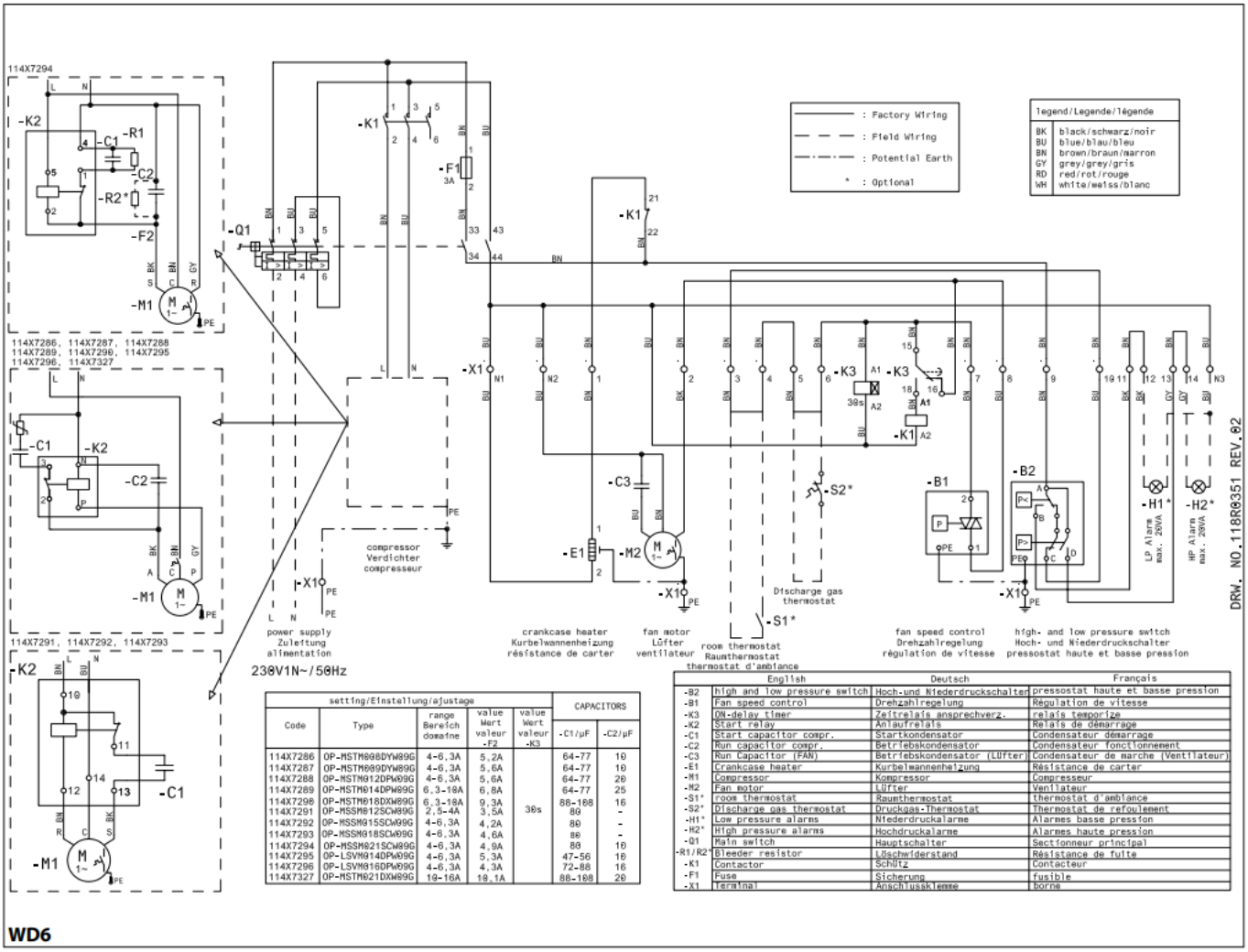


setting/Einstellung/ajustage				
Code	Type	range Bereich	value Wert valeur -F2	value Wert valeur -K3
114X7235	OP-MSTM026DSW05E	4-6A	4,8A	30s
114X7236	OP-MSTM034DSW05E	5,5-8A	6,4A	
114X7245	OP-LSVM048NTW05E	4-6A	4,8A	
114X7247	OP-LSVM068NTW05E	7-10A	8,4A	

	English	Deutsch	Français
-B2	high and low pressure switch	Hoch-und Niederdruckschalter	pressostat haute et basse pression
-B1*	Fan speed control	Drehzahlregelung	Régulation de vitesse
-K3	ON-delay timer	Zeitrelais ansprechverz.	relais temporize
-C3	Run capacitor (FAN)	Betriebskondensator (Lüfter)	Condensateur de marche (Ventilateur)
-E1	Crankcase heater	Kurbelwannenheizung	Résistance de carter
-M1	Compressor	Kompressor	Compresseur
-M2	Fan motor	Lüfter	Venilateur
-F1	Main switch	Hauptschalter	Sectionneur principal
-F2	Overload relay	Überlastrelais	Relais de surcharge
-K1	Contactor	Schütz	Contacteur
-F3	Fuse	Sicherung	fusible
-S1*	room thermostat	Raumthermostat	thermostat d'ambiance
-S2*	Discharge gas thermostat	Druckgas-Thermostat	Thermostat de refoulement
-H1*	Low pressure alarms	Niederdruckalarme	Alarmes basse pression
-H2*	High pressure alarms	Hochdruckalarme	Alarmes haute pression
-X1	Terminal	Anschlussklemme	borne

WD5

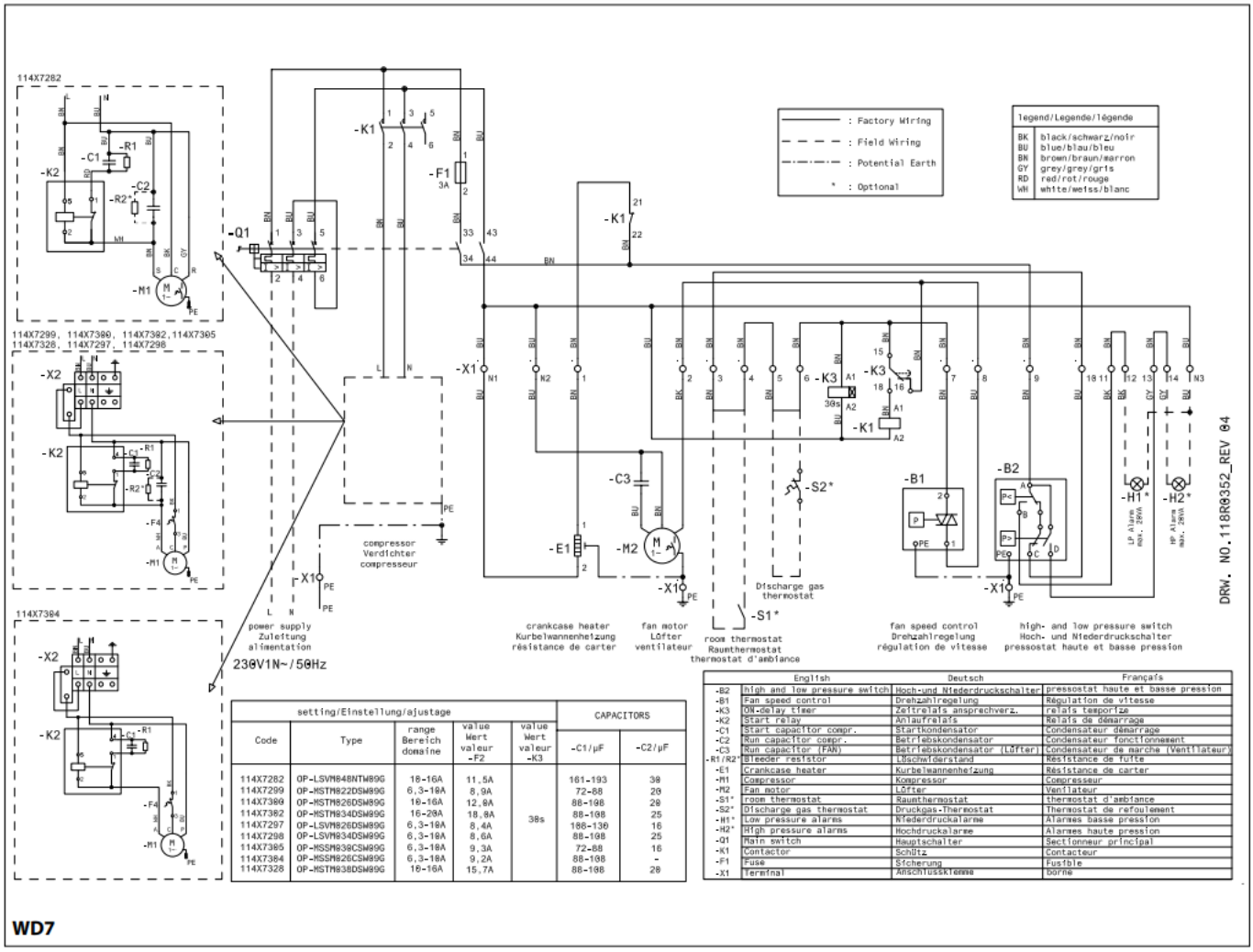
Code G (W09) : OP-MSTM008,009,012,014,018 & OP-MSSM012,015,018,021 & OP-LSVM014,016



setting/Einstellung/ajustage					CAPACITORS	
Code	Type	range Bereich domaine	value Wert valeur -F2	value Wert valeur -K3	-C1/µF	-C2/µF
114X7286	OP-MSTM088DYW99G	4-6,3A	5,2A		64-77	10
114X7287	OP-MSTM089DYW89G	4-6,3A	5,6A		64-77	10
114X7288	OP-MSTM012DPW09G	4-6,3A	5,6A		64-77	20
114X7289	OP-MSTM014DPW99G	6,3-10A	6,8A		64-77	25
114X7290	OP-MSTM016DXW89G	6,3-10A	9,3A	30s	88-108	16
114X7291	OP-MSSM012SCW99G	2,5-4A	3,5A		80	-
114X7292	OP-MSSM015SCW99G	4-6,3A	4,2A		80	-
114X7293	OP-MSSM018SCW09G	4-6,3A	4,6A		80	-
114X7294	OP-MSSM021SCW99G	4-6,3A	4,9A		80	10
114X7295	OP-LSVM014DPW09G	4-6,3A	5,3A		47-56	10
114X7296	OP-LSVM016DPW89G	4-6,3A	4,3A		72-88	16
114X7327	OP-MSTM021DXW89G	10-16A	10,1A		88-108	20

	English	Deutsch	Français
-B2	high and low pressure switch	Hoch-und Niederdruckschalter	pressostat haute et basse pression
-B1	Fan speed control	Drehzahlregelung	Régulation de vitesse
-K3	ON-delay timer	Zeitrelais ansprechverz.	relais temporize
-K2	Start relay	Anlaufrelais	Relais de démarrage
-C1	Start capacitor compr.	Startkondensator	Condensateur démarrage
-C2	Run capacitor compr.	Betriebskondensator	Condensateur fonctionnement
-C3	Run Capacitor (FAN)	Betriebskondensator (Lüfter)	Condensateur de marche (Ventilateur)
-E1	Crankcase heater	Kurbelwannenheizung	Résistance de carter
-M1	Compressor	Kompressor	Compresseur
-M2	Fan motor	Lüfter	Ventilateur
-S1*	room thermostat	Raumthermostat	thermostat d'ambiance
-S2*	Discharge gas thermostat	Druckgas-Thermostat	Thermostat de refoulement
-H1*	Low pressure alarms	Niederdruckalarme	Alarmes basse pression
-H2*	High pressure alarms	Hochdruckalarme	Alarmes haute pression
-Q1	Main switch	Hauptschalter	Sectionneur principal
-R1/R2*	Bleeder resistor	Löschwiderstand	Résistance de fuite
-K1	Contactor	Schütz	Contacteur
-F1	Fuse	Sicherung	fusible
-X1	Terminal	Anschlussklemme	borne

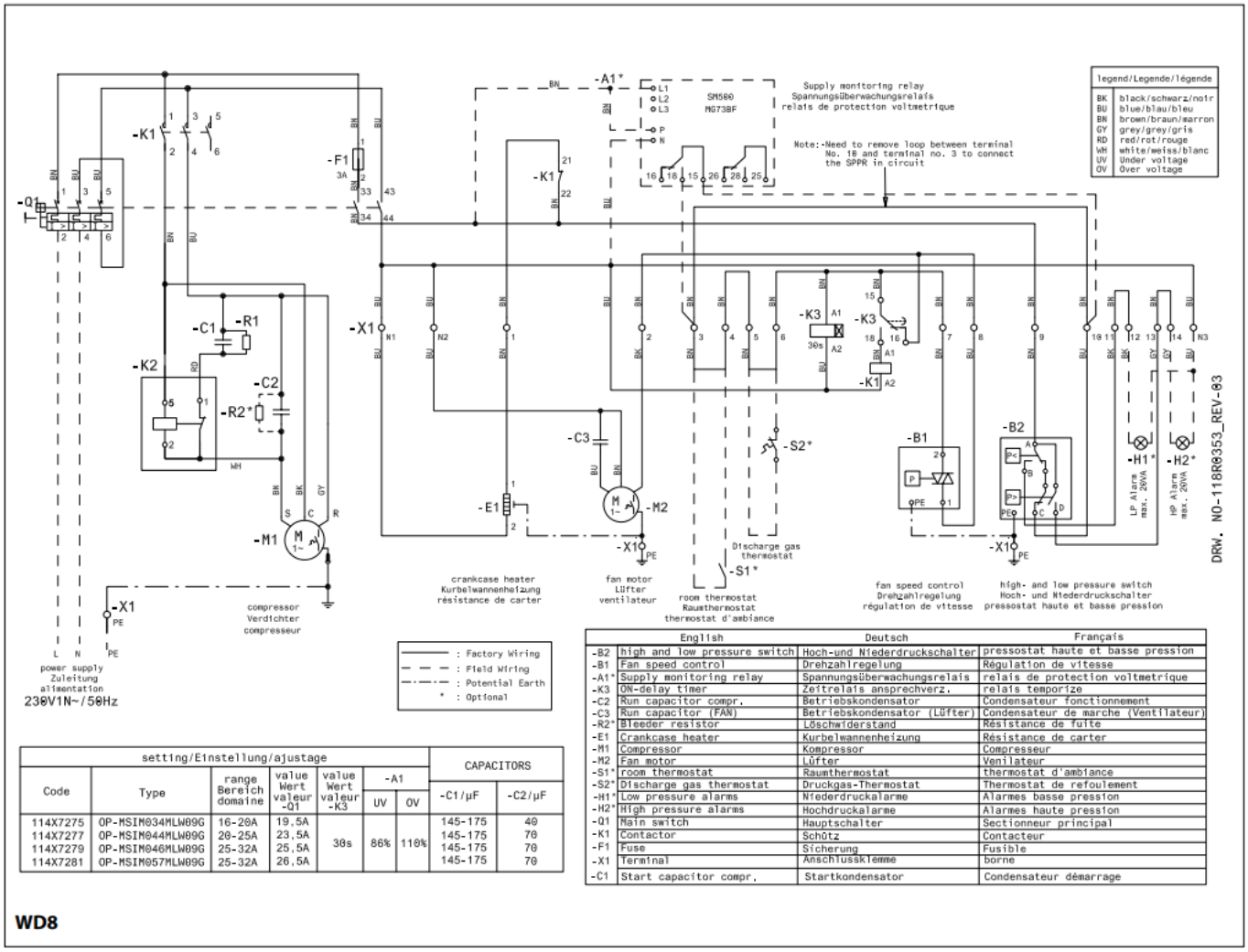
Code G (W09) : OP-LSVM048,068 & OP-MSTM022,026,034 & OP-LSVM026,034 & OP-MSSM030,026,038



setting/Einstellung/ajustage					CAPACITORS	
Code	Type	range Bereich domaine	value Wert valeur -F2	value Wert valeur -K3	-C1/µF	-C2/µF
114X7282	OP-LSVM848NTW89G	10-16A	11,5A	38s	161-193	38
114X7299	OP-MSTM822DSW89G	6,3-10A	8,9A		72-88	20
114X7300	OP-MSTM826DSW89G	10-16A	12,8A		88-108	20
114X7302	OP-MSTM834DSW89G	16-20A	18,8A		88-108	25
114X7297	OP-LSVM826DSW89G	6,3-10A	8,4A		188-130	16
114X7298	OP-LSVM834DSW89G	6,3-10A	8,6A		88-108	25
114X7305	OP-MSSM838CSW89G	6,3-10A	9,3A		72-88	16
114X7304	OP-MSSM826CSW89G	6,3-10A	9,2A		88-108	-
114X7328	OP-MSTM838DSW89G	10-16A	15,7A		88-108	20

	English	Deutsch	Français
-B2	high and low pressure switch	Hoch-und Niederdruckschalter	pressostat haute et basse pression
-B1	Fan speed control	Drehzahlregelung	Régulation de vitesse
-K3	ON-delay timer	Zeitrelais ansprechverz.	relais temporize
-K2	Start relay	Anlaufrelais	Relais de démarrage
-C1	Start capacitor compr.	Startkondensator	Condensateur démarrage
-C2	Run capacitor compr.	Betriebskondensator	Condensateur fonctionnement
-C3	Run capacitor (FAN)	Betriebskondensator (Lüfter)	Condensateur de marche (Ventilateur)
-R1/R2*	Bleeder resistor	Löschwiderstand	Résistance de fuite
-E1	Crankcase heater	Kurbelwannenheizung	Résistance de carter
-M1	Compressor	Kompressor	Compresseur
-M2	Fan motor	Lüfter	Ventilateur
-S1*	room thermostat	Raumthermostat	thermostat d'ambiance
-S2*	Discharge gas thermostat	Druckgas-Thermostat	Thermostat de refoulement
-H1*	Low pressure alarms	Niederdruckalarme	Alarmes basse pression
-H2*	High pressure alarms	Hochdruckalarme	Alarmes haute pression
-Q1	Main switch	Hauptschalter	Sectionneur principal
-K1	Contactor	Schütz	Contacteur
-F1	Fuse	Sicherung	Fusible
-X1	Terminal	Anschlussklemme	borne

Code G (W09) : OP-MSIM034,044,046,057

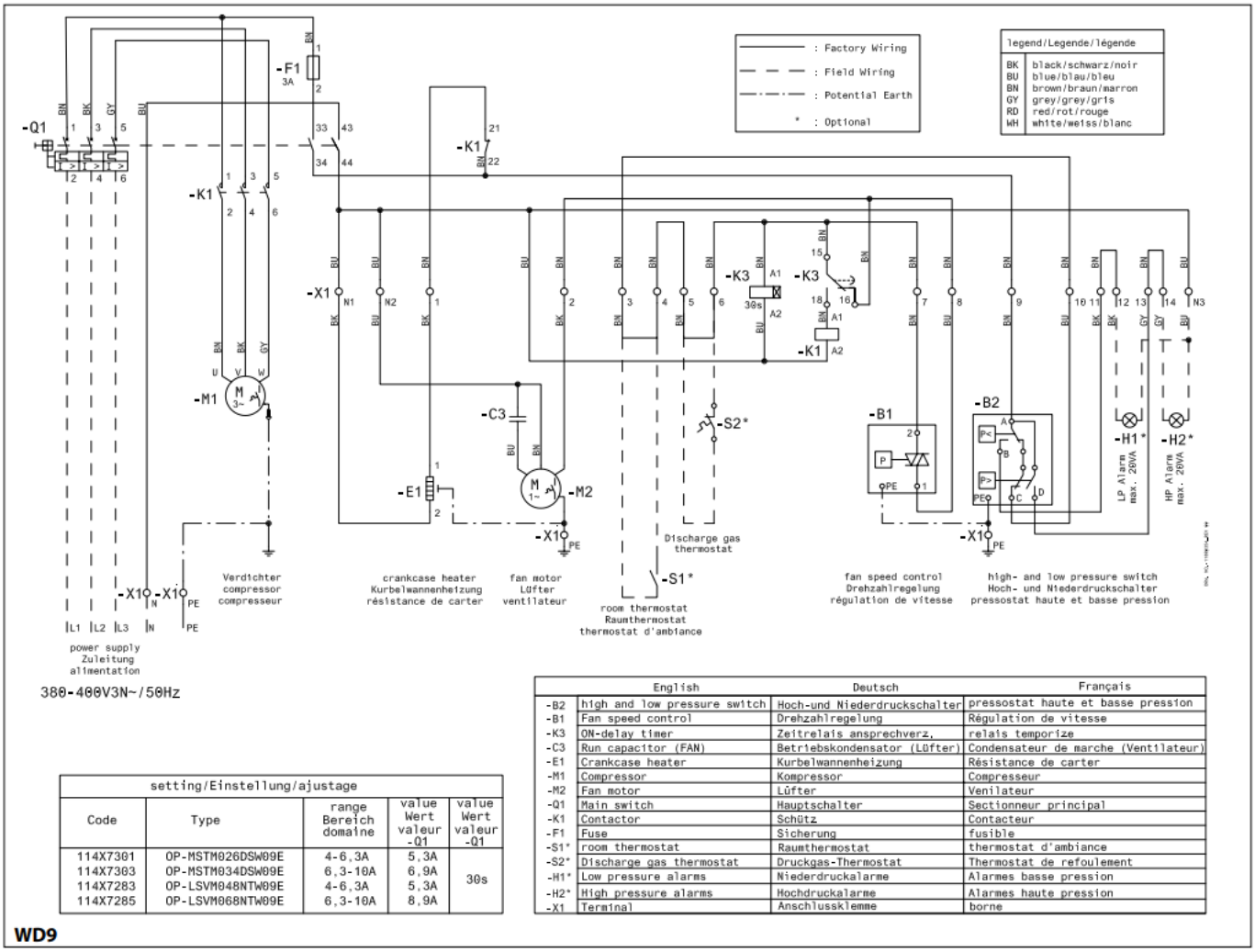


setting/Einstellung/ajustage							CAPACITORS	
Code	Type	range Bereich domaine	value Wert valeur -Q1	value Wert valeur -K3	-A1		-C1/µF	-C2/µF
					UV	OV		
114X7275	OP-MSIM034MLW09G	16-20A	19,5A	30s	86%	110%	145-175	40
114X7277	OP-MSIM044MLW09G	20-25A	23,5A				145-175	70
114X7279	OP-MSIM046MLW09G	25-32A	25,5A				145-175	70
114X7281	OP-MSIM057MLW09G	25-32A	26,5A				145-175	70

	English	Deutsch	Français
-B2	high and low pressure switch	Hoch-und Niederdruckschalter	pressostat haute et basse pression
-B1	Fan speed control	Drehzahlregelung	Régulation de vitesse
-A1*	Supply monitoring relay	Spannungsüberwachungsrelais	relais de protection voltmétrique
-K3	ON-delay timer	Zeitrelais ansprechverz.	relais temporize
-C2	Run capacitor compr.	Betriebskondensator	Condensateur fonctionnement
-C3	Run capacitor (FAN)	Betriebskondensator (Lüfter)	Condensateur de marche (Ventilateur)
-R2*	Bleeder resistor	Löschwiderstand	Résistance de fuite
-E1	Crankcase heater	Kurbelwannenheizung	Résistance de carter
-M1	Compressor	Kompressor	Compresseur
-M2	Fan motor	Lüfter	Ventilateur
-S1*	room thermostat	Raumthermostat	thermostat d'ambiance
-S2*	Discharge gas thermostat	Druckgas-Thermostat	Thermostat de refoulement
-H1*	Low pressure alarms	Niederdruckalarme	Alarmes basse pression
-H2*	High pressure alarms	Hochdruckalarme	Alarmes haute pression
-Q1	Main switch	Hauptschalter	Sectionneur principal
-K1	Contactor	Schütz	Contacteur
-F1	Fuse	Sicherung	Fusible
-X1	Terminal	Anschlussklemme	borne
-C1	Start capacitor compr.	Startkondensator	Condensateur démarrage

WD8

Code E (W09) : OP-MSTM026,034 & OP-LSVM048,068

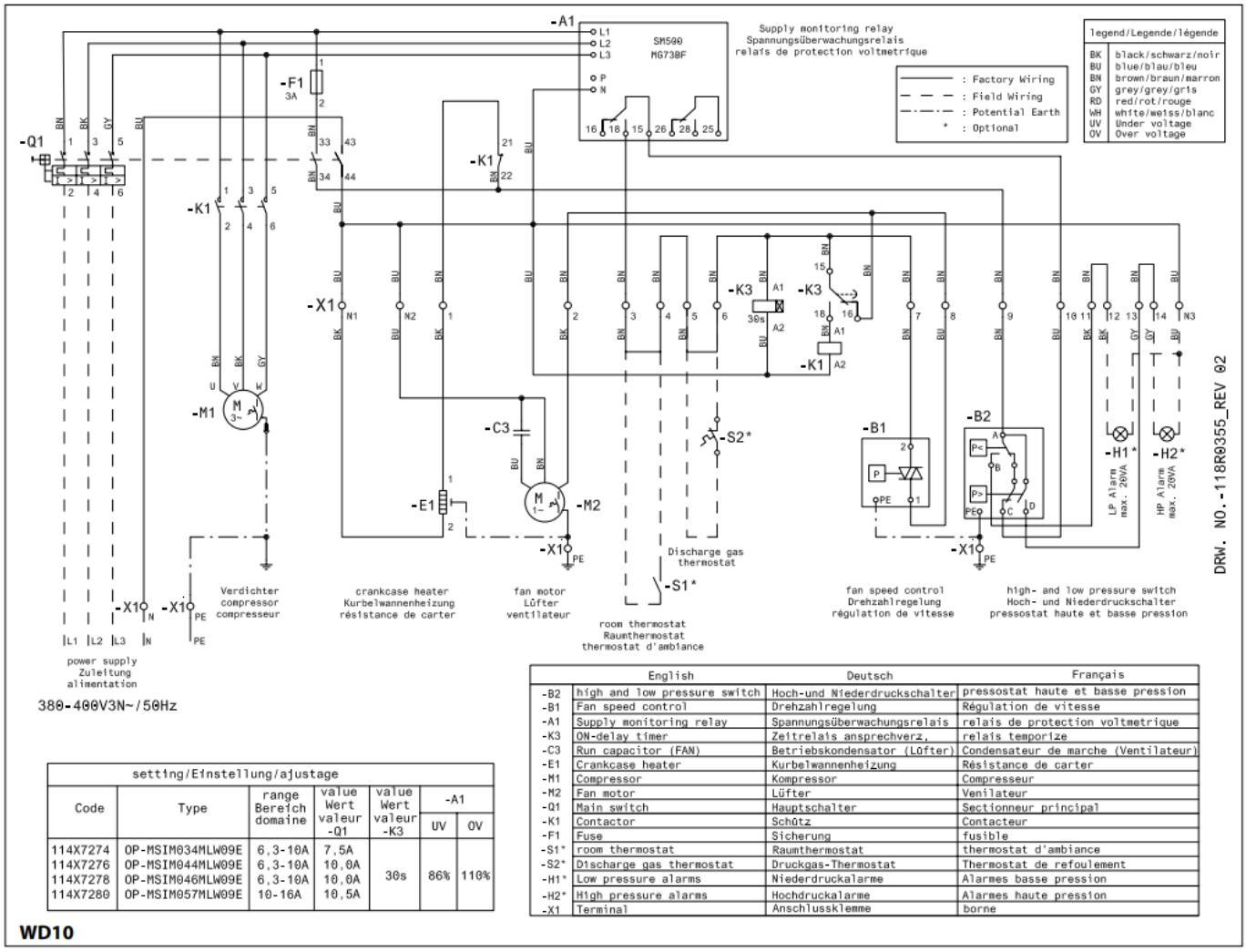


setting/Einstellung/ajustage				
Code	Type	range Bereich domaine	value Wert valeur -Q1	value Wert valeur -Q1
114X7301	OP-MSTM026DSW09E	4-6,3A	5,3A	30s
114X7303	OP-MSTM034DSW09E	6,3-10A	6,9A	
114X7283	OP-LSVM048NTW09E	4-6,3A	5,3A	
114X7285	OP-LSVM068NTW09E	6,3-10A	8,9A	

	English	Deutsch	Français
-B2	high and low pressure switch	Hoch-und Niederdruckschalter	pressostat haute et basse pression
-B1	Fan speed control	Drehzahlregelung	Régulation de vitesse
-K3	ON-delay timer	Zeitrelais ansprechverz.	relais temporize
-C3	Run capacitor (FAN)	Betriebskondensator (Lüfter)	Condensateur de marche (Ventilateur)
-E1	Crankcase heater	Kurbelwannenheizung	Résistance de carter
-M1	Compressor	Kompressor	Compresseur
-M2	Fan motor	Lüfter	Venilateur
-Q1	Main switch	Hauptschalter	Sectionneur principal
-K1	Contactor	Schütz	Contacteur
-F1	Fuse	Sicherung	fusible
-S1*	room thermostat	Raumthermostat	thermostat d'ambiance
-S2*	Discharge gas thermostat	Druckgas-Thermostat	Thermostat de refoulement
-H1*	Low pressure alarms	Niederdruckalarme	Alarmes basse pression
-H2*	High pressure alarms	Hochdruckalarme	Alarmes haute pression
-X1	Terminal	Anschlussklemme	borne

WD9

Code E (W09) : OP-MSIM034,044,046,057

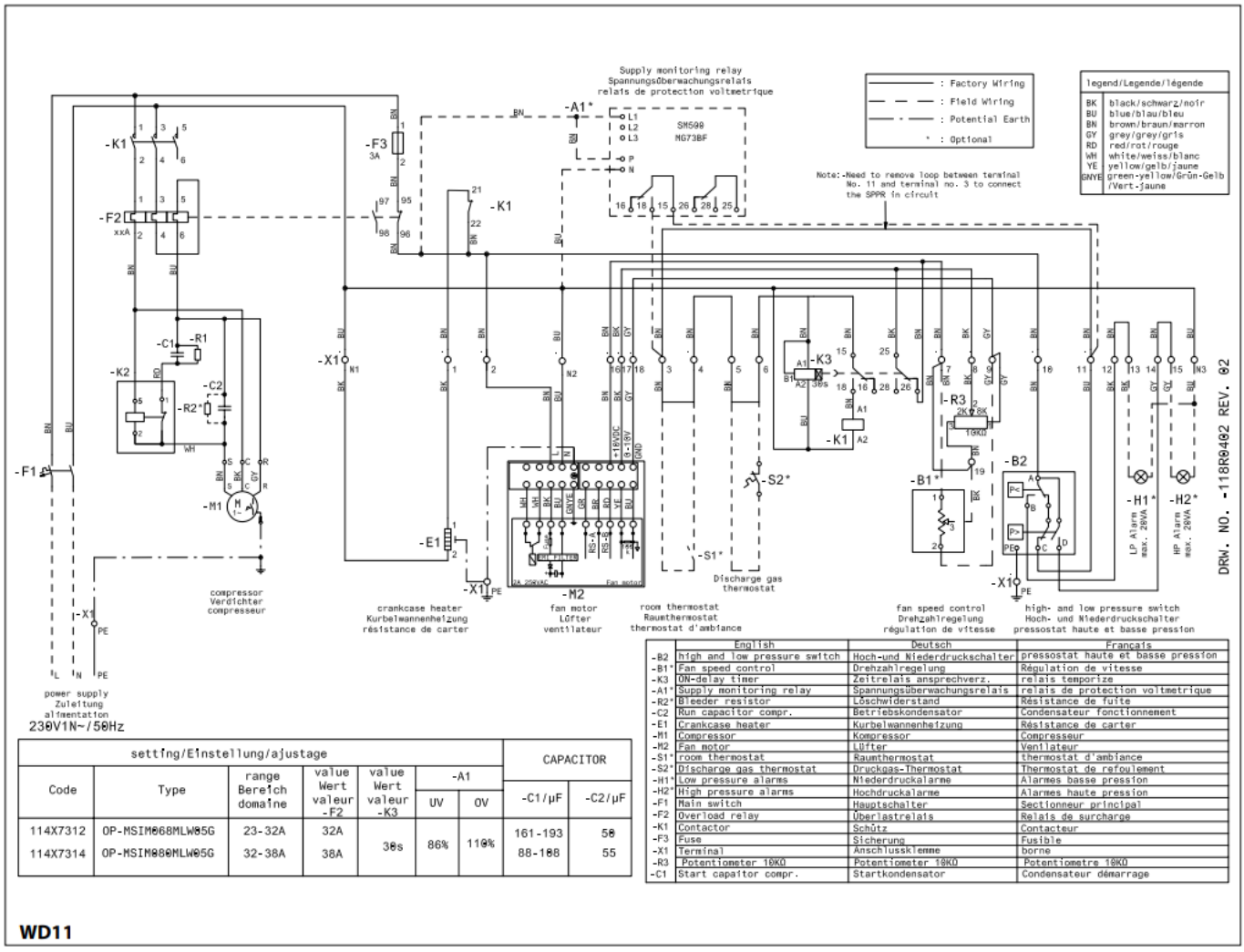


setting/Einstellung/ajustage						
Code	Type	range Bereich domaine	value Wert valeur -Q1	value Wert valeur -K3	-A1	
					UV	OV
114X7274	OP-MSIM034MLW09E	6,3-10A	7,5A	30s	86%	110%
114X7276	OP-MSIM044MLW09E	6,3-10A	10,0A			
114X7278	OP-MSIM046MLW09E	6,3-10A	10,0A			
114X7280	OP-MSIM057MLW09E	10-16A	10,5A			

	English	Deutsch	Français
-B2	high and low pressure switch	Hoch-und Niederdruckschalter	pressostat haute et basse pression
-B1	Fan speed control	Drehzahlregelung	Régulation de vitesse
-A1	Supply monitoring relay	Spannungsüberwachungsrelais	relais de protection voltmetrique
-K3	ON-delay timer	Zeitrelais ansprechverz,	relais temporize
-C3	Run capacitor (FAN)	Betriebskondensator (Lüfter)	Condensateur de marche (Ventilateur)
-E1	Crankcase heater	Kurbelwannenheizung	Résistance de carter
-M1	Compressor	Kompressor	Compresseur
-M2	Fan motor	Lüfter	Venilateur
-Q1	Main switch	Hauptschalter	Sectionneur principal
-K1	Contactor	Schütz	Contacteur
-F1	Fuse	Sicherung	fusible
-S1*	room thermostat	Raumthermostat	thermostat d'ambiance
-S2*	Discharge gas thermostat	Druckgas-Thermostat	Thermostat de refoulement
-H1*	Low pressure alarms	Niederdruckalarme	Alarmes basse pression
-H2*	High pressure alarms	Hochdruckalarme	Alarmes haute pression
-X1	Terminal	Anschlussklemme	borne

WD10

Code G (W05) : OP-MSIM068,080

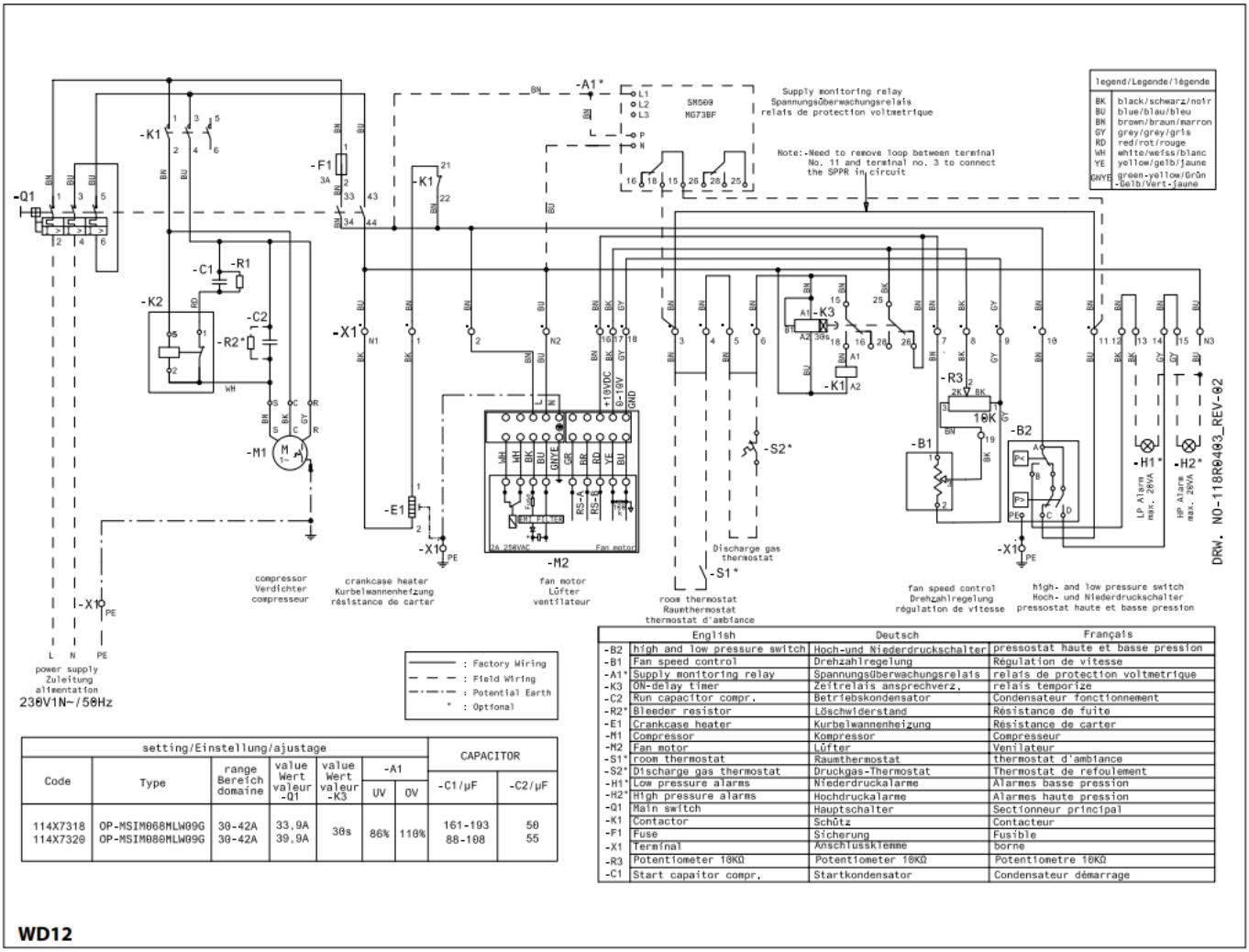


setting/Einstellung/ajustage							CAPACITOR	
Code	Type	range Bereich domaine	value Wert valeur -F2	value Wert valeur -K3	-A1		-C1/µF	-C2/µF
					UV	OV		
114X7312	OP-MSIM068MLW05G	23-32A	32A	30s	86%	110%	161-193	50
114X7314	OP-MSIM080MLW05G	32-38A	38A				88-108	55

	English	Deutsch	Français
-B2	high and low pressure switch	Hoch-und Niederdruckschalter	pressostat haute et basse pressfon
-B1*	Fan speed control	Drehzahlregelung	Régulation de vitesse
-K3	ON-delay timer	Zeitrelais ansprechverz.	relais temporize
-A1*	Supply monitoring relay	Spannungsüberwachungsrelais	relais de protection voltmetrique
-R2*	Bleeder resistor	Löschwiderstand	Résistance de fuite
-C2	Run capacitor compr.	Betriebskondensator	Condensateur fonctionnement
-E1	Crankcase heater	Kurbelwannenhefzung	Résistance de carter
-M1	Compressor	Kompressor	Compresseur
-M2	Fan motor	Lüfter	Ventilateur
-S1*	room thermostat	Raumthermostat	thermostat d'ambiance
-S2*	Discharge gas thermostat	Druckgas-Thermostat	Thermostat de refoulement
-H1*	Low pressure alarms	Niederdruckalarme	Alarmes basse pression
-H2*	High pressure alarms	Hochdruckalarme	Alarmes haute pression
-F1	Main switch	Hauptschalter	Sectionneur principal
-F2	Overload relay	Überlastrelais	Relais de surcharge
-K1	Contactor	Schütz	Contacteur
-F3	Fuse	Sicherung	Fusible
-X1	Terminal	Anschlussklemme	borne
-R3	Potentiometer 10KΩ	Potentiometer 10KΩ	Potentiometre 10KΩ
-C1	Start capaitor compr.	Startkondensator	Condensateur démarrage

WD11

Code G (W09) : OP-MSIM068,080

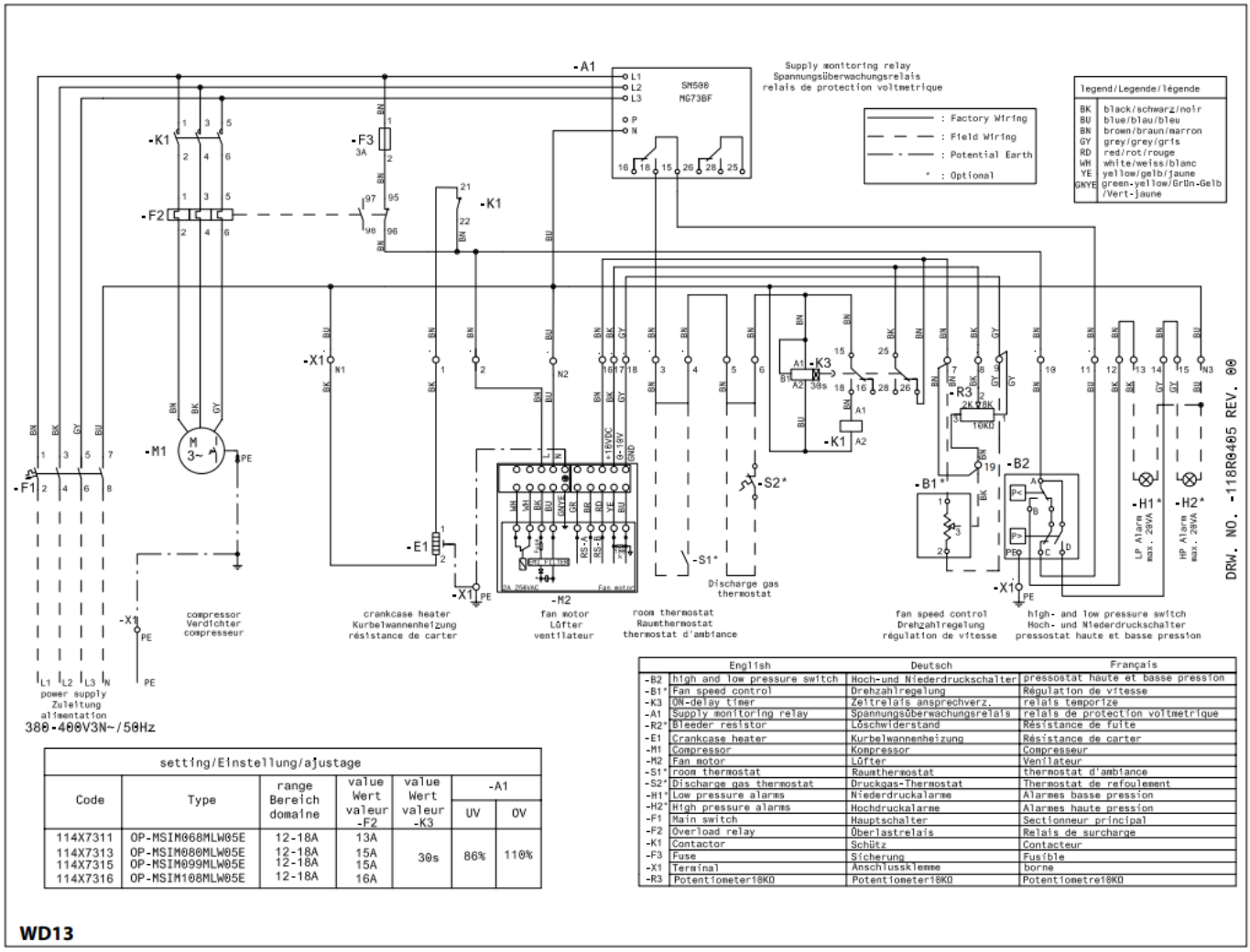


English		Deutsch	Français
-B2	high and low pressure switch	Hoch-und Niederdruckschalter	pressostat haute et basse pression
-B1	Fan speed control	Drehzahlregelung	Régulation de vitesse
-A1*	Supply monitoring relay	Spannungsüberwachungsrelais	relais de protection voltmetrique
-K3	ON-delay timer	Zeitrelais ansprechverz,	relais temporize
-C2	Run capacitor compr.	Betriebskondensator	Condensateur fonctionnement
-R2*	Bleeder resistor	Löschwiderstand	Résistance de fuite
-E1	Crankcase heater	Kurbelwannenheizung	Résistance de carter
-M1	Compressor	Kompressor	Compresseur
-M2	Fan motor	Lüfter	Ventilateur
-S1*	room thermostat	Raumthermostat	thermostat d'ambiance
-S2*	Discharge gas thermostat	Druckgas-Thermostat	Thermostat de refoulement
-H1*	Low pressure alarms	Niederdruckalarme	Alarmes basse pression
-H2*	High pressure alarms	Hochdruckalarme	Alarmes haute pression
-Q1	Main switch	Hauptschalter	Sectionneur principal
-K1	Contactor	Schütz	Contacteur
-F1	Fuse	Sicherung	Fusible
-X1	Terminal	Anschlussklemme	borne
-R3	Potentiometer 10KΩ	Potentiometer 10KΩ	Potentiometre 10KΩ
-C1	Start capaitor compr.	Startkondensator	Condensateur démarrage

setting/Einstellung/ajustage							CAPACITOR	
Code	Type	range Bereich domaine	value Wert valeur -Q1	value Wert valeur -K3	-A1		-C1/µF	-C2/µF
					UV	OV		
114X7318	OP-MSIM068MLW09G	30-42A	33,9A	30s	86%	110%	161-193	50
114X7320	OP-MSIM080MLW09G	30-42A	39,9A				88-108	55

WD12

Code E (W05) : OP-MSIM068,080,099,108

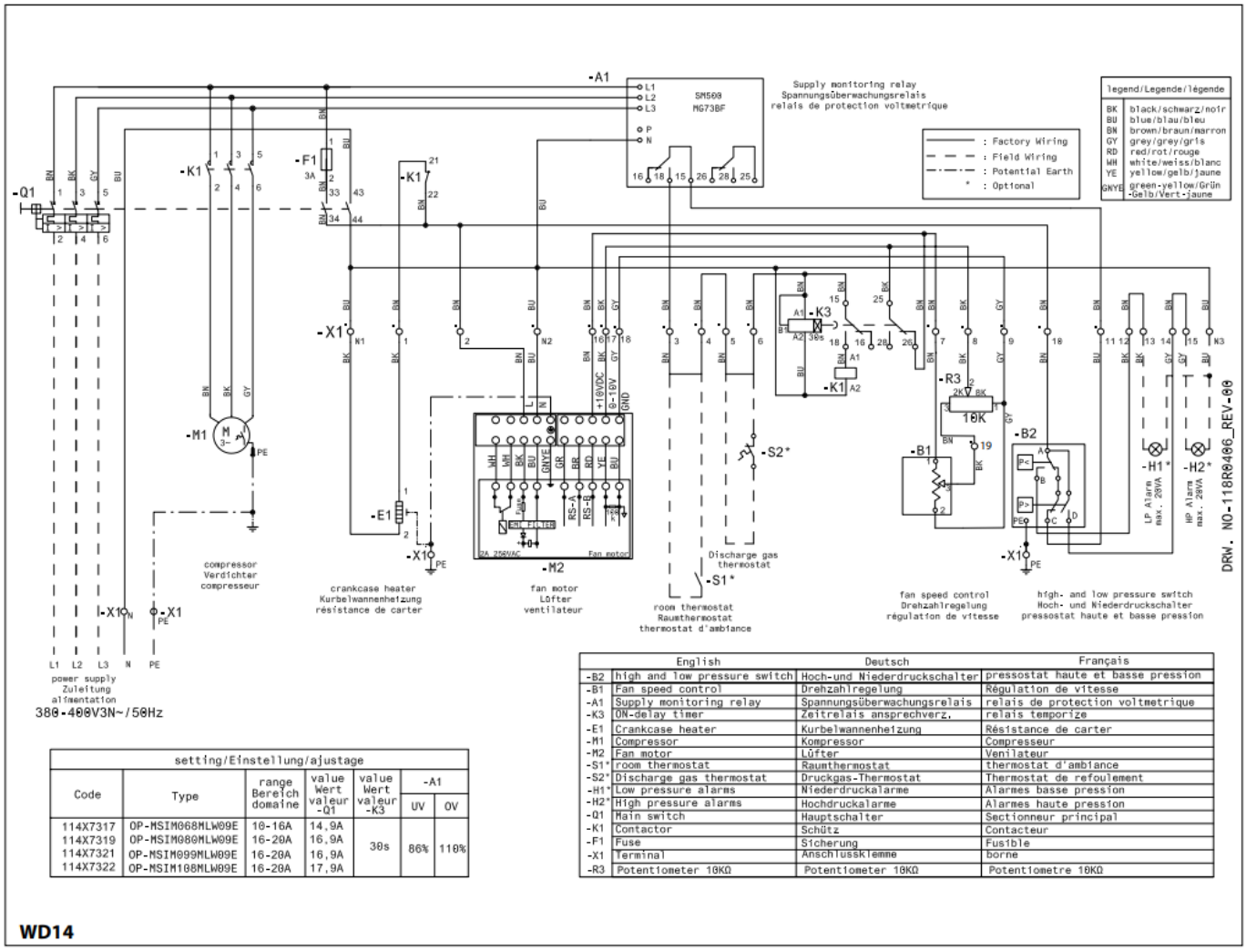


setting/Einstellung/ajustage						
Code	Type	range Bereich domaine	value Wert valeur -F2	value Wert valeur -K3	-A1	
					UV	OV
114X7311	OP-MSIM068MLW05E	12-18A	13A	30s	86%	110%
114X7313	OP-MSIM080MLW05E	12-18A	15A			
114X7315	OP-MSIM099MLW05E	12-18A	15A			
114X7316	OP-MSIM108MLW05E	12-18A	16A			

	English	Deutsch	Français
-B2	high and low pressure switch	Hoch-und Niederdruckschalter	pressostat haute et basse pression
-B1*	Fan speed control	Drehzahlregelung	Régulation de vitesse
-K3	ON-delay timer	Zeitrelais ansprechverz.	relais temporize
-A1	Supply monitoring relay	Spannungsüberwachungsrelais	relais de protection voltmetrique
-R2*	Bleeder resistor	Löschwiderstand	Résistance de fuite
-E1	Crankcase heater	Kurbelwannenheizung	Résistance de carter
-M1	Compressor	Kompressor	Compresseur
-M2	Fan motor	Lüfter	Ventilateur
-S1*	room thermostat	Raumthermostat	thermostat d'ambiance
-S2*	Discharge gas thermostat	Druckgas-Thermostat	Thermostat de refoulement
-H1*	Low pressure alarms	Niederdruckalarme	Alarmes basse pression
-H2*	High pressure alarms	Hochdruckalarme	Alarmes haute pression
-F1	Main switch	Hauptschalter	Sectionneur principal
-F2	Overload relay	Überlastrelais	Relais de surcharge
-K1	Contactor	Schütz	Contacteur
-F3	Fuse	Sicherung	Fusible
-X1	Terminal	Anschlussklemme	borne
-R3	Potentiometer10KΩ	Potentiometer10KΩ	Potentiometre10KΩ

WD13

Code E (W09) : OP-MSIM068,080,099,108



setting/Einstellung/ajustage						
Code	Type	range Bereich domaine	value Wert valeur -Q1	value Wert valeur -K3	-A1	
					UV	OV
114X7317	OP-MSIM068MLW09E	10-16A	14,9A	30s	86%	110%
114X7319	OP-MSIM080MLW09E	16-20A	16,9A			
114X7321	OP-MSIM099MLW09E	16-20A	16,9A			
114X7322	OP-MSIM108MLW09E	16-20A	17,9A			

	English	Deutsch	Français
-B2	high and low pressure switch	Hoch-und Niederdruckschalter	pressostat haute et basse pression
-B1	Fan speed control	Drehzahlregelung	Régulation de vitesse
-A1	Supply monitoring relay	Spannungsüberwachungsrelais	relais de protection voltmétrique
-K3	ON-delay timer	Zeitrelais ansprechverz.	relais temporize
-E1	Crankcase heater	Kurbelwannenheizung	Résistance de carter
-M1	Compressor	Kompressor	Compresseur
-M2	Fan motor	Lüfter	Venilateur
-S1*	room thermostat	Raumthermostat	thermostat d'ambiance
-S2*	Discharge gas thermostat	Druckgas-Thermostat	Thermostat de refoulement
-H1*	Low pressure alarms	Niederdruckalarme	Alarmes basse pression
-H2*	High pressure alarms	Hochdruckalarme	Alarmes haute pression
-Q1	Main switch	Hauptschalter	Sectionneur principal
-K1	Contactor	Schütz	Contacteur
-F1	Fuse	Sicherung	Fusible
-X1	Terminal	Anschlussklemme	borne
-R3	Potentiometer 10KΩ	Potentiometer 10KΩ	Potentiometre 10KΩ

WD14

Legend

- **BK** black
- **BU** blue
- **BN** brown
- **GY** grey
- **RD** red
- **WH** white
- **A1** Voltage relay
- **A1*** Voltage relay (option)
- **B1** Fan speed controller
- **B1*** Fan speed controller (option)
- **B2** High and Low-pressure switch
- **C1** Start capacitor compressor
- **C2** Run capacitor compressor
- **C3** Run capacitor fan
- **E1** Crankcase heater
- **F1** Main switch
- **F2** Overload relay
- **F3** Fuse control circuit
- **F4** Compressor thermal protector

- **H1** LP alarm
- **H2** HP alarm
- **K1** Contactor
- **K2** Start relay
- **K3** On-timer relay
- **M1** Compressor
- **M2** Fan motor
- **R1,R2,R2*** Bleeder resistor
- **S1*** Room thermostat (option)
- **S2*** Discharge gas thermostat (option)
- **X1** Terminals
    - Option (remove bridge)

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www.danfoss.com.

Documents / Resources

	Danfoss OP-LSVM Optyma Slim Packaged Condensing Unit [pdf] Instruction Manual OP-LSVM, OP-LSVM Optyma Slim Packaged Condensing Unit, Optyma Slim Packaged Condensing Unit, Slim Packaged Condensing Unit, Packaged Condensing Unit, Condensing Unit, Unit

References

- User Manual