WOODWARD

Product Manual 35090
(Revision -, 1/2018)
Original Instructions

Motril 5-DVP Cabinet

Installation Manual

General Precautions

Read this entire manual and all other publications pertaining to the work to be performed before installing, operating, or servicing this equipment.

Practice all plant and safety instructions and precautions.

Failure to follow instructions can cause personal injury and/or property damage.

Revisions

This publication may have been revised or updated since this copy was produced. To verify that you have the latest revision, check manual *26455*, *Customer Publication Cross Reference and Revision Status & Distribution Restrictions*, on the *publications page* of the Woodward website:

www.woodward.com/publications

The latest version of most publications is available on the *publications page*. If your publication is not there, please contact your customer service representative to get the latest copy.

Proper Use

Any unauthorized modifications to or use of this equipment outside its specified mechanical, electrical, or other operating limits may cause personal injury and/or property damage, including damage to the equipment. Any such unauthorized modifications: (i) constitute "misuse" and/or "negligence" within the meaning of the product warranty thereby excluding warranty coverage for any resulting damage, and (ii) invalidate product certifications or listings.

Translated Publications

If the cover of this publication states "Translation of the Original Instructions" please note:

The original source of this publication may have been updated since this translation was made. Be sure to check manual *26455*, *Customer Publication Cross Reference and Revision Status & Distribution Restrictions*, to verify whether this translation is up to date. Out-of-date translations are marked with ⚠. Always compare with the original for technical specifications and for proper and safe installation and operation procedures.

Revisions—A bold, black line alongside the text identifies changes in this publication since the last revision.

Manual 35090

Contents

Illustrations and Tables

Warnings and Notices

Important Definitions

This is the safety alert symbol used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

- **DANGER** - Indicates a hazardous situation, which if not avoided, will result in death or serious injury.
- **WARNING** - Indicates a hazardous situation, which if not avoided, could result in death or serious injury.
- **CAUTION** - Indicates a hazardous situation, which if not avoided, could result in minor or moderate injury.
- **NOTICE** - Indicates a hazard that could result in property damage only (including damage to the control).
- **IMPORTANT** - Designates an operating tip or maintenance suggestion.

⚠WARNING

Overspeed / Overtemperature / Overpressure

The engine, turbine, or other type of prime mover should be equipped with an overspeed shutdown device to protect against runaway or damage to the prime mover with possible personal injury, loss of life, or property damage.

The overspeed shutdown device must be totally independent of the prime mover control system. An overtemperature or overpressure shutdown device may also be needed for safety, as appropriate.

⚠WARNING

Personal Protective Equipment

The products described in this publication may present risks that could lead to personal injury, loss of life, or property damage. Always wear the appropriate personal protective equipment (PPE) for the job at hand. Equipment that should be considered includes but is not limited to:

- **Eye Protection**
- **Hearing Protection**
- **Hard Hat**
- **Gloves**
- **Safety Boots**
- **Respirator**

Always read the proper Material Safety Data Sheet (MSDS) for any working fluid(s) and comply with recommended safety equipment.

⚠WARNING

Start-up

Be prepared to make an emergency shutdown when starting the engine, turbine, or other type of prime mover, to protect against runaway or overspeed with possible personal injury, loss of life, or property damage.

Electrostatic Discharge Awareness

NOTICE

Electrostatic Precautions

Electronic controls contain static-sensitive parts. Observe the following precautions to prevent damage to these parts:

- **Discharge body static before handling the control (with power to the control turned off, contact a grounded surface and maintain contact while handling the control).**
- **Avoid all plastic, vinyl, and Styrofoam (except antistatic versions) around printed circuit boards.**
- **Do not touch the components or conductors on a printed circuit board with your hands or with conductive devices.**

To prevent damage to electronic components caused by improper handling, read and observe the precautions in Woodward manual *82715*, *Guide for Handling and Protection of Electronic Controls, Printed Circuit Boards, and Modules*.

Follow these precautions when working with or near the control.

1. Avoid the build-up of static electricity on your body by not wearing clothing made of synthetic materials. Wear cotton or cotton-blend materials as much as possible because these do not store static electric charges as much as synthetics.
2. Do not remove the printed circuit board (PCB) from the control cabinet unless absolutely necessary. If you must remove the PCB from the control cabinet, follow these precautions:
   - Do not touch any part of the PCB except the edges.
   - Do not touch the electrical conductors, the connectors, or the components with conductive devices or with your hands.
   - When replacing a PCB, keep the new PCB in the plastic antistatic protective bag it comes in until you are ready to install it. Immediately after removing the old PCB from the control cabinet, place it in the antistatic protective bag.

IMPORTANT

External wiring connections for reverse-acting controls are identical to those for direct-acting controls.

Regulatory Compliance

European Compliance for CE Marking:
These directive listings are limited only to those units bearing the CE Mark and declared in the declarations section:

EMC Directive:	Declared to 2014/30/EU COUNCIL DIRECTIVE of 26 February 2014 on the harmonization of the laws of the Member States relating to electromagnetic compatibility (EMC) and all applicable amendments.
Low Voltage Directive:	Declared to Directive 2014/35/EU on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits.

Special Conditions for Safe Use:

This equipment is to be installed by professional service personnel according to the instructions given in this manual. Meeting EMC compliance declarations also depends on this requirement.

A fixed wiring installation is required and must be in accordance with the authority having jurisdiction. PERMANENTLY CONNECTED EQUIPMENT requires the special considerations to satisfy IEC 61010-1, including overcurrent and fault protection as required. Field wiring must be suitable for at least maximum T_{amb}+10°C.

This device is considered permanently connect and requires a fixed wiring installation. Protective Earth Grounding is required by the input PE terminals (See Installation Chapter). Ground leakage current exceeds 3.5mA. Verify the PE terminal has been connected prior to applying power to the cabinet.

A disconnection device is not supplied with the system. A disconnecting switch or circuit breaker shall be included in the building installation. It shall be in close proximity to the equipment and within easy reach of the operator. This device shall be clearly marked as the disconnecting device for the equipment. The disconnecting switch or circuit breaker shall not interrupt the protective earth conductor.

To ensure stability and to prevent accidental tipping, lift equipment only as described in the installation chapter, and bolt the system cabinet to the building structure before operation of the equipment.

Measurement inputs are classified as permanently connected IEC measurement Category I and are designed to safely withstand occasional transient overvoltages up to 707 V (pk).

For environmental specifications, refer to the Specifications Appendix in this manual.

⚠WARNING

To avoid the danger of electric shock, do not use measurement inputs to make measurements within measurement categories II, III, or IV.

⚠WARNING

The control cabinet contains hazardous live voltages. Only individuals who have received proper training should open the cabinet door and perform service. Equipment should be isolated or disconnected from hazardous live voltages before servicing.

⚠WARNING

This equipment is considered indicator equipment and is not to be used as metrology equipment. All measurements need to be verified using calibrated equipment.

WARNING

Substitution of components may impair CE listing and create instability of the equipment and is not recommended.

WARNING

External fire protection is not provided in the scope of this product. It is the responsibility of the user to satisfy any applicable requirements for their system.

WARNING

To reduce risk of electrical shock, Protective Earth (PE) must be connected to the PE terminal identified with the ⏚ symbol. The conductor providing the connection must have a properly sized ring lug and wire gauge equal to or larger than 4mm² (12AWG)

Safety Symbols


Direct Current


Alternating Current


Both Alternating and Direct Current


Caution, risk of electrical shock


Caution, refer to accompanying documents


Protective conductor terminal

Chapter 1.
General Information

Introduction

The LM6000PF DVP Cabinets uses five Digital Valve Positioners (DVP) used to control actuation systems on reciprocating engines and turbines. This DVP Cabinet accepts redundant CAN inputs.

The 5-DVP cabinet consists of five DVP assemblies mounted on a steel plate, installed vertically inside an IP56 metal cabinet. Each DVP is powered by a separate 125 V (dc) bus, and is individually protected by a 10 A (dc) circuit breaker. In addition to these separate bus inputs there is a 15A breaker and 10A breaker for 125V (dc) inputs. The 15A breaker is used to power the staging valves. The 10A breaker feeds a 125V (dc) to 24V (dc) power supply that supplies power to various auxiliary cabinet hardware, (heater, fan, light, etc.). All Input-Output cables will enter-exit the cabinet through the bottom of the cabinet where the Roxtec Blocks are provided.

The operation of the DVP cabinet is very tightly tied to the operation of the DVP that is inside this cabinet. Woodward manual 26329 documents the operation and capabilities of the DVP itself. Also, refer to the Woodward Control Wiring Diagram 9971-1958 and Layout Drawing 9934-1581 for wiring to the cabinet. This diagram is included with the cabinet.

Additionally Woodward manual 26640 for RTCnet Distributed I/O modules documents the operation and capabilities of the RTCnet modules.

Specific third party items that may be applicable to compliance are addressed by their individual Declaration Of Conformity (DOC) in the Appendix of this manual.

Purpose and Scope

The purpose of this manual is to provide the necessary background information for installing the DVP cabinet appropriately. Topics covered include mechanical installation and electrical wiring. See Woodward Control Wiring Diagram 9971-1958 and Layout Drawing 9934-1581 for additional information.

IMPORTANT

Be sure that you have the latest revision of this manual. Updates are available through Woodward. Contact your Customer Service Representative or check the Woodward website (www.woodward.com/searchpublications.aspx).

How to Use the DVP Cabinet

The following summarizes how to install DVP cabinet:

- Unpack and inspect the hardware.
- Mount and wire the hardware following the procedures and recommendations in Chapter 2.
- Find DVP Electronic configuration (2-board stack) and operation in 1.2K DVP manual 26329.
- Find RTCnet Node specifications and operation in RTCnet Manual 26640.
- Troubleshooting guidelines for the system are in this manual.
- Specifications are in the DVP Control Specifications section.

Intended Applications

The Woodward DVP is a state-of-the-art driver for electric actuation. It features a rugged and compact design. The DVP provides positioning based on a demand signal from the control systems, and is designed for use with various Woodward valves and actuators. Multiple-input-type configurations allow use of the DVP with many different turbine controllers. The driver supports redundant installations.

Chapter 2.
Installation

WARNING

The engine, turbine, or other type of prime mover should be equipped with an overspeed/misfire/detonation detection shutdown device(s) to protect against runaway or damage to the prime mover with possible personal injury, loss of life, or property damage.

The overspeed/misfire/detonation detection shutdown device must be totally independent of the prime mover control system.

Mechanical Installation Requirements

This section provides the general information for mounting location selection, installation, and wiring of the DVP cabinet. A detailed control-wiring diagram is supplied with the cabinet.

Unpacking the Shipping Carton

- Before unpacking the cabinet, refer to the inside front cover of this manual and to the Regulatory Compliance page for warnings and cautions. Be careful when unpacking the cabinet. Check for signs of damage such as bent or dented panels, scratches, and loose or broken parts. If any damage is found, notify the shipper immediately.
- The DVP cabinet leaves the factory in a wooden crate. Always use this crate or one that is similar for transport or storage of the DVP when not installed. Read the Electrostatic Discharge Awareness page before handling the DVP.
- Check for and remove all manuals, connectors, mounting screws, and other items before discarding the shipping box.
- Notify the shipper and Woodward if damage is found.

General Installation Notes and Warnings

When selecting a location for mounting the DVP cabinet consider the following:

- Protect the unit from environments harsher than IP56.
- Provide adequate ventilation for cooling. Shield the unit from radiant heat sources like direct sunlight.
- The DVP cabinet must be floor-mounted and secured with appropriate hardware to a flat surface.
- Allow adequate space around the unit for servicing and cable routing. All cabling will enter/exit from the bottom of the cabinet.
- Do not install near high-voltage or high-current devices.
- Verify that cable lengths do not exceed 45 m between the DVP cabinet and valve. Verify the cable lengths do not exceed 100 m between the DVP cabinet and the engine control system.

NOTICE

Do not mount the DVP cabinet near sources of excessive radiant heat such as exhaust manifolds or other excessively hot engine components.

WARNING

For communication wires, use wires with a temperature rating of at least 5 °C above surrounding ambient. All others use wires with a temperature rating of at least 10 °C above surrounding ambient.

Mounting the DVP Cabinet

See Figure 2-2 for mounting-hole locations and mounting-hole pattern. Securely attach the DVP cabinet to a surface that will not exceed the vibration limits specified in the DVP Cabinet Specifications in this manual.

- Lift the DVP cabinet using the eyebolts on top of the cabinet.
- Open the DVP cabinet door.
- Install the mounting bolts in the four lower mounting holes.
- Tighten all four bolts to the required torque value for this bolt size grade.

Cabinet

The standard cabinet is a floor-mounted and front-access version. Input power and field cable access are available through the bottom of the cabinet. The system ships fully wired and assembled within the cabinet. The provided cabinet meets IP56 ratings using the Roxtec Blocks provided.

Table 2-1. Cabinet Specifications

Dimensions:	2000 mm (79 inches) high x 800 mm (31 inches) wide x 600 mm (24 inches) deep
Material:	Housing: Carbon Steel, 1.5 mm Door: Carbon Steel, 2.0 mm Rear Panel: Carbon Steel, 1.5 mm Base: Carbon Steel, 1.5 mm Mounting Plate: Carbon Steel, 3.0 mm
Finish:	Housing, door and rear panel: Dipcoat-primed, powder-coated on the outside, textured paint Mounting plate: Zinc-Plated Base: Dipcoat-primed, powder-coated, textured paint Color: Gray, RAL 7035
Ratings:	NEMA 4, 12, 13 or IP56
Operating Ambient Temperature:	(–10 to +45) °C / (+14 to +113) °F 70 °C (2 hours transient)
Weight:	5-DVP cabinet, 268 kg (590 lb) (including DVPs)

DVP Cabinet Outline Drawing

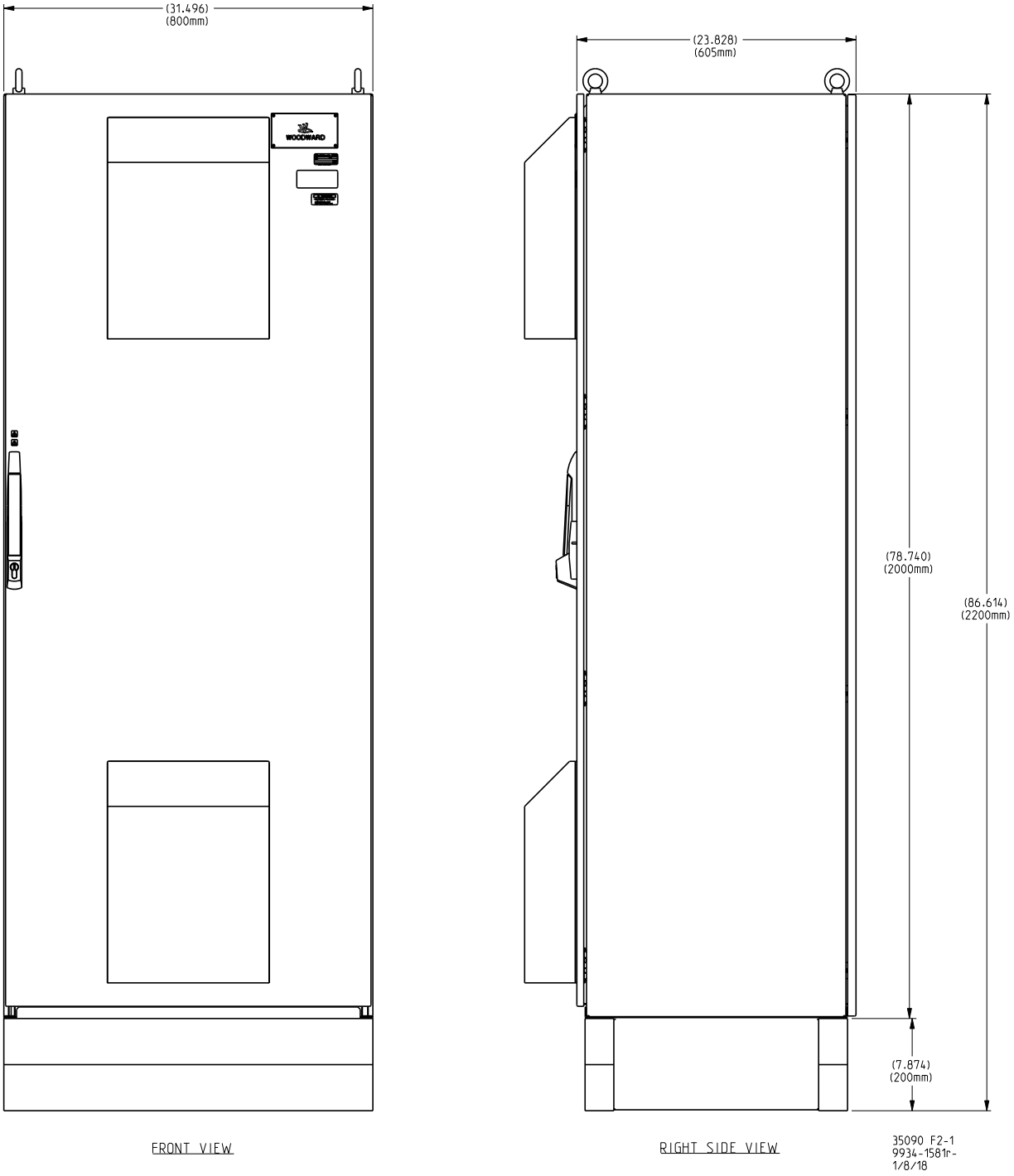


Figure 2-1. Outline Drawing

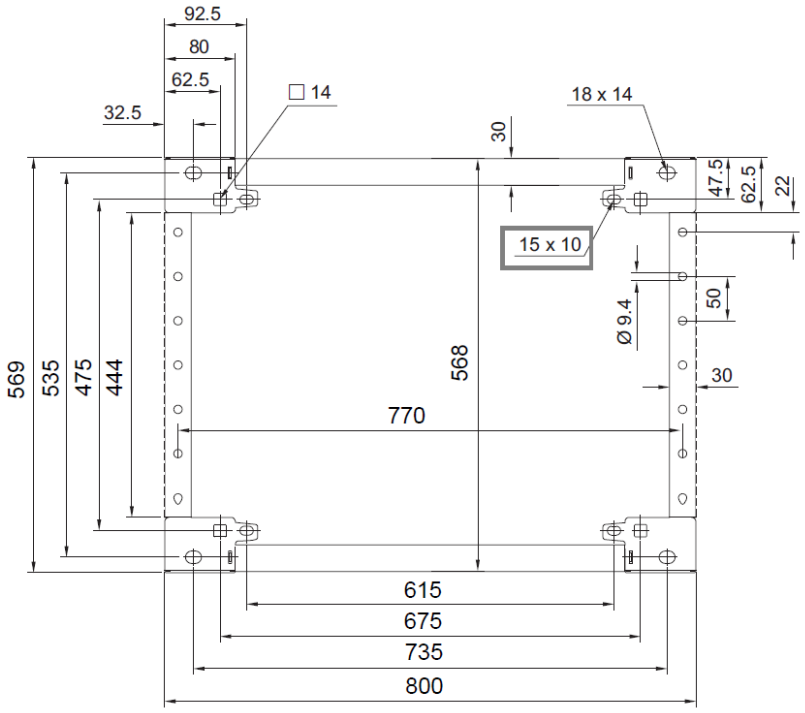


Figure 2-2. Bottom view Mounting (15x10mm slots)

Wiring, Grounding and Shielding

The use of shielded-twisted cabling is required where indicated by the control-wiring diagram in order to insure EMC compliance. Terminate the cable shield as indicated by the control-wiring diagram, following the installation notes below.

Installation Notes

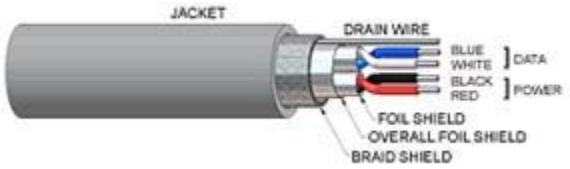
- All wires will be twisted shielded wiring except for input power and actuator drive wiring which will be twisted wires. Pass the shield through the interface connector using a pin(s) of the connector. Terminate these shields inside the DVP cabinet.
- All wires will be inside an overbraid shield except the input power. Bond this overbraid to the interface connector using a 360-degree bond.
- If the shielded cables described above are contained in a metal armored cable, ground the metal armor (shield) to the same interface connectors.
- Use CAN Communication Cable specified in Figure 2-3.
- For the 125Vdc input, CB1 - CB7 will accept 1.5 mm2 to 25mm2 (16 - 4 AWG). PE Ground Terminal Block connections are available next to the Circuit Breakers.
- Terminal blocks for CAN will accept 0.2 mm² to 6 mm² (24–10 AWG).
- Wire per the control-wiring diagram provided with the DVP cabinet.

NOTICE

Failure to provide shielding can produce future conditions which are difficult to diagnose. Proper shielding at the time of installation is required to assure satisfactory operation of the product.

Thick cable is preferred and recommended for all uses. Most CAN / DeviceNet cable is not rated for temperatures above 80 °C so be careful during installation to avoid hot routing areas. Always use shielded cables for improved communications in industrial environments.

Table 2-2. CAN Cable Specification



Impedance:	120 Ω ±10% at 1 MHz
DC resistance:	< 7Ω per 1000 ft
Cable capacitance:	12 pF/ft at 1 kHz
Propagation delay	1.36 ns/ft (maximum)
Data Pair:	19 strands, 1.0 mm² corresponds to 18 AWG, individually tinned, 3 twists/foot
Power Pair:	19 strands, 1.5 mm² corresponds to 15 AWG, individually tinned, 3 twists/foot
Drain / Shield Wire:	19 strands Tinned Copper shielding braid or shielding braid and foil
Cable type:	Twisted pair cable. 2x2 lines
Bend Radius:	20x diameter during installation or 7x diameter fixed position
Signal attenuation:	0.13 dB/100 ft @ 125 kHz (maximum) 0.25 dB/100 ft @ 500 kHz (maximum) 0.40 dB/100 ft @ 1000 kHz (maximum)

Recommended Bulk Cable

Cable manufacturer Turck and Belden are widely available in North America. Turck, Lumberg, and Lapp Cable products are available in Europe. All cables below are suitable for DeviceNet trunk and drop cabling. Be aware that cable vendors may not use the same wire colors on individual conductors.

*__Note:__ Turck and Lumberg can also provide custom length cord sets with connectors.

Table 2-3. Cable Manufactures

Manufacturer	Part Number	Website
Belden	3082A DeviceNet Thick Cable–Grey	www.belden.com
Belden	3083A DeviceNet Thick Cable–Yellow	www.belden.com
Lapp Cable	2710-250 Unitronic DeviceNet Thick	www.lappcable.com
Lumberg	STL 613	www.lumbergusa.com
Turck	Type 575, DeviceNet Thick Cable – Grey	www.turck.com

Figure 2-3. Roxtec Blocks for Cable Entry/Exit

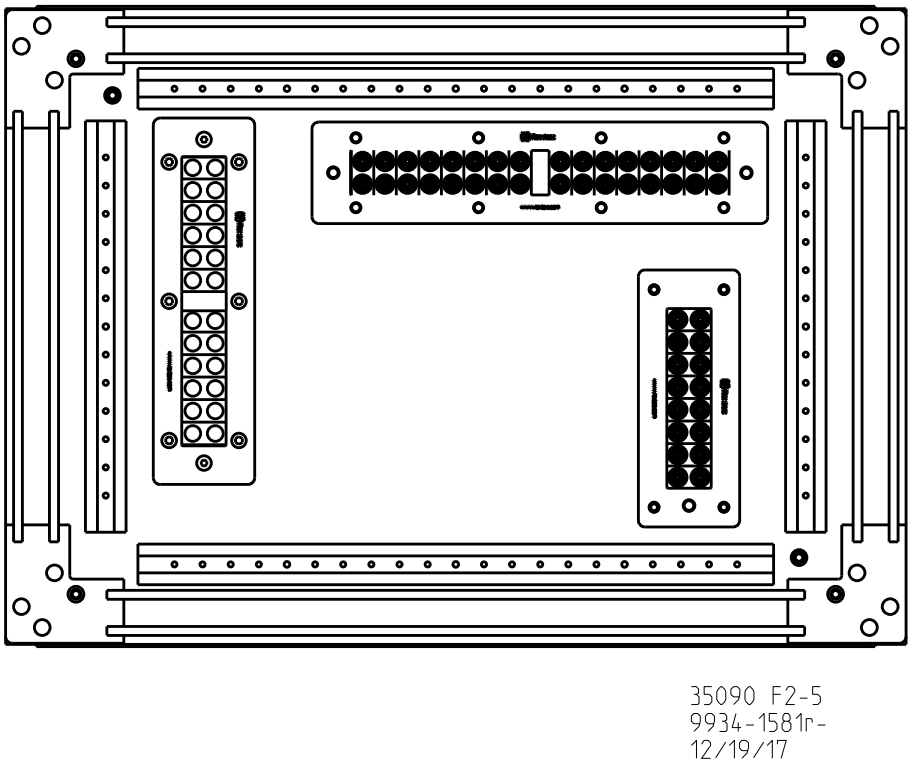


Figure 2-4. Position of Roxtec Blocks

Power Input Requirements

Each DVP is powered by a separate 125 V (dc) bus and is individually protected by a 10 A (dc) circuit breaker(s). In addition to these separate bus inputs there is a 15A breaker and 10A breaker for 125V (dc) inputs. The 15A breaker is used to power the staging valves. The 10A breaker feeds a 125V (dc) to 24V (dc) power supply that supplies power to various auxiliary cabinet hardware, (heater, fan, light, etc.). All Input-Output cables will enter-exit the cabinet through the bottom of the cabinet where the Roxtec Blocks are provided.

IMPORTANT

For the DVP Power Input version, please observe the following:

DVP A1–A5 are powered by 125 V (dc) sources
Turn-off CB's to remove power to:

- **DVP A1: CB1**
- **DVP A2: CB2**
- **DVP A3: CB3**
- **DVP A4: CB4**
- **DVP A5: CB5**
- **PS1 (Fans and Heater): CB6**
- **STAGING VALVES: CB7**

To remove power from entire system, turn off all above CBs.

See Woodward Control Wiring Diagram 9971-1958 for all power wiring details and connections.

Chapter 3.
Troubleshooting

WARNING

Follow all local plant safety instructions and precautions before proceeding with Troubleshooting.

Introduction

This chapter addresses several possible causes and recommended actions for many common problems that are possible with a system including the DVP cabinet; its power source, the actuator/valve assembly, and the wiring interconnect between these components.

Woodward manual 26329 provides a detailed troubleshooting guide for the 1.2K DVP that is inside the DVP cabinet. The diagnostic codes received over the CAN interface and/or through the DVP Service Tool can be found in the DVP Service Tool manual (26912).

WARNING

This troubleshooting guide is not recommended nor intended to resolve all possible issues. Contact Woodward Technical Support for assistance (see Chapter 4).

DVP Troubleshooting Guide

Diagnostic Indications	Probable Causes	Recommended Action
	--- I/O Diagnostics ---	
Power-up Detection: No power to DVP Cabinet.	Open power wire to Cabinet.	Inspect power wiring to the DVP cabinet.
	Wiring is correct but the power is not present.	Ensure power breaker/fuse for DVP cabinet is operating properly.
Power-up Detection: No power to DVP Cabinet	If the breaker inside the cabinet is open, power will not reach the DVP module in the cabinet.	Check the breaker in the DVP cabinet is closed.
	Power is out of range, proper operation will not occur.	Ensure input voltage is 125 V (dc) +0 %, –28 %.
	The DVP is functioning improperly.	Refer to DVP manual 26329, Chapter 3, External DVP Diagnostics section.
No Communication Detection: No CAN Interface	Open CAN wire in the CAN cable.	Inspect CAN wiring to the DVP cabinet. Ensure CAN connector is installed properly.
	CAN Interface is not over a controlled impedance interface.	Ensure CAN terminators are in place. Ensure the CAN interface is over a controlled impedance cable (110 Ω).
	CAN Information is present at the input to the DVP Cabinet.	Check that the breaker in the DVP Cabinet is closed. Ensure the power supply output voltage is (120 ± 8) V (dc). Ensure the DVP is functioning properly. Refer to DVP manual 26329, Chapter 3, External DVP Diagnostics section. Use Service Tool to access the diagnostic from the DVP, Refer to DVP manual 26329, Chapter 4, Getting Started with the DVP Service Tool section.
Shutdown Detection: Alarm and Fault diagnostic codes received over CAN	Diagnostic codes received with system shutdown.	Use Service Tool to access the diagnostic from the DVP, Refer to DVP Manual 26329, Chapter 4, Getting Started with the DVP Service Tool section.
No Shutdown Detection: Alarm and fault diagnostic codes received over CAN	Diagnostic codes received with no system shutdown.	Use Service Tool to access the diagnostic from the DVP, Refer to DVP Manual 26329, Chapter 4, Getting Started with the DVP Service Tool section.

Chapter 4.
System Maintenance

Cables and Connections

Periodically check the cables to make sure they are still in good condition, and check the connectors to make sure they are plugged in all the way.

Fans

Remove power prior to replacing the heater fan or the cooling fan. Only qualified personnel should replace the fans. As a preventive maintenance, it is recommended that the cooling fan be replaced every 50 000 hours and the heater fan assembly every 75 000 hours. For replacement, use fans of like specification, or purchase replacement fans from Woodward.

Fan Filter

Periodic cleaning or replacement of fan filter may be necessary. Woodward recommends performing fan filter inspection on a periodic basis. Clean and/or replace fan filter when airflow is being restricted. Frequency of cleaning and/or replacement depends on site conditions. When needed, order replacement fan filters through the cabinet manufacturer's website, or local representative.

⚠WARNING

Substitution of components may impair CE listing and create instability of the equipment and is not recommended.

Chapter 5.
Product Support and Service Options

Product Support Options

If you are experiencing problems with the installation, or unsatisfactory performance of a Woodward product, the following options are available:

- Consult the troubleshooting guide in the manual.
- Contact the manufacturer or packager of your system.
- Contact the Woodward Full Service Distributor serving your area.
- Contact Woodward technical assistance (see “How to Contact Woodward” later in this chapter) and discuss your problem. In many cases, your problem can be resolved over the phone. If not, you can select which course of action to pursue based on the available services listed in this chapter.

OEM or Packager Support: Many Woodward controls and control devices are installed into the equipment system and programmed by an Original Equipment Manufacturer (OEM) or Equipment Packager at their factory. In some cases, the programming is password-protected by the OEM or packager, and they are the best source for product service and support. Warranty service for Woodward products shipped with an equipment system should also be handled through the OEM or Packager. Please review your equipment system documentation for details.

Woodward Business Partner Support: Woodward works with and supports a global network of independent business partners whose mission is to serve the users of Woodward controls, as described here:

- A **Full Service Distributor** has the primary responsibility for sales, service, system integration solutions, technical desk support, and aftermarket marketing of standard Woodward products within a specific geographic area and market segment.
- An **Authorized Independent Service Facility (AISF)** provides authorized service that includes repairs, repair parts, and warranty service on Woodward's behalf. Service (not new unit sales) is an AISF's primary mission.
- A **Recognized Turbine Retrofitter (RTR)** is an independent company that does both steam and gas turbine control retrofits and upgrades globally, and can provide the full line of Woodward systems and components for the retrofits and overhauls, long term service contracts, emergency repairs, etc.

A current list of Woodward Business Partners is available at **www.woodward.com/directory**.

Product Service Options

The following factory options for servicing Woodward products are available through your local Full-Service Distributor or the OEM or Packager of the equipment system, based on the standard Woodward Product and Service Warranty (5-01-1205) that is in effect at the time the product is originally shipped from Woodward or a service is performed:

- Replacement/Exchange (24-hour service)
- Flat Rate Repair
- Flat Rate Remanufacture

Replacement/Exchange: Replacement/Exchange is a premium program designed for the user who is in need of immediate service. It allows you to request and receive a like-new replacement unit in minimum time (usually within 24 hours of the request), providing a suitable unit is available at the time of the request, thereby minimizing costly downtime. This is a flat-rate program and includes the full standard Woodward product warranty (Woodward Product and Service Warranty 5-01-1205).

This option allows you to call your Full-Service Distributor in the event of an unexpected outage, or in advance of a scheduled outage, to request a replacement control unit. If the unit is available at the time of the call, it can usually be shipped out within 24 hours. You replace your field control unit with the like-new replacement and return the field unit to the Full-Service Distributor.

Charges for the Replacement/Exchange service are based on a flat rate plus shipping expenses. You are invoiced the flat rate replacement/exchange charge plus a core charge at the time the replacement unit is shipped. If the core (field unit) is returned within 60 days, a credit for the core charge will be issued.

Flat Rate Repair: Flat Rate Repair is available for the majority of standard products in the field. This program offers you repair service for your products with the advantage of knowing in advance what the cost will be. All repair work carries the standard Woodward service warranty (Woodward Product and Service Warranty 5-01-1205) on replaced parts and labor.

Flat Rate Remanufacture: Flat Rate Remanufacture is very similar to the Flat Rate Repair option with the exception that the unit will be returned to you in “like-new” condition and carry with it the full standard Woodward product warranty (Woodward Product and Service Warranty 5-01-1205). This option is applicable to mechanical products only.

Returning Equipment for Repair

If a control (or any part of an electronic control) is to be returned for repair, please contact your Full-Service Distributor in advance to obtain Return Authorization and shipping instructions.

When shipping the item(s), attach a tag with the following information:
- Return authorization number
- Name and location where the control is installed
- Name and phone number of contact person
- Complete Woodward part number(s) and serial number(s)
- Description of the problem
- Instructions describing the desired type of repair

Packing a Control

Use the following materials when returning a complete control:
- Protective caps on any connectors
- Antistatic protective bags on all electronic modules
- Packing materials that will not damage the surface of the unit
- At least 100 mm (4 inches) of tightly packed, industry-approved packing material
- A packing carton with double walls
- A strong tape around the outside of the carton for increased strength

NOTICE

To prevent damage to electronic components caused by improper handling, read and observe the precautions in Woodward manual 82715, *Guide for Handling and Protection of Electronic Controls, Printed Circuit Boards, and Modules*.

Replacement Parts

When ordering replacement parts for controls, include the following information:

- The part number(s) (XXXX-XXXX) that is on the enclosure nameplate
- The unit serial number, which is also on the nameplate

Engineering Services

Woodward offers various Engineering Services for our products. For these services, you can contact us by telephone, by email, or through the Woodward website.

- Technical Support
- Product Training
- Field Service

Technical Support is available from your equipment system supplier, your local Full-Service Distributor, or from many of Woodward's worldwide locations, depending upon the product and application. This service can assist you with technical questions or problem solving during the normal business hours of the Woodward location you contact. Emergency assistance is also available during non-business hours by phoning Woodward and stating the urgency of your problem.

Product Training is available as standard classes at many of our worldwide locations. We also offer customized classes, which can be tailored to your needs and can be held at one of our locations or at your site. This training, conducted by experienced personnel, will assure that you will be able to maintain system reliability and availability.

Field Service engineering on-site support is available, depending on the product and location, from many of our worldwide locations or from one of our Full-Service Distributors. The field engineers are experienced both on Woodward products as well as on much of the non-Woodward equipment with which our products interface.

For information on these services, please contact us via telephone, email us, or use our website: **www.woodward.com**.

Contacting Woodward's Support Organization

For the name of your nearest Woodward Full-Service Distributor or service facility, please consult our worldwide directory at **www.woodward.com/directory**, which also contains the most current product support and contact information.

You can also contact the Woodward Customer Service Department at one of the following Woodward facilities to obtain the address and phone number of the nearest facility at which you can obtain information and service.

Products Used in Electrical Power Systems

Facility	Phone Number
Brazil	+55 (19) 3708 4800
China	+86 (512) 6762 6727
Germany:	
Kempen	+49 (0) 21 52 14 51
Stuttgart	+49 (711) 78954-510
India	+91 (124) 4399500
Japan	+81 (43) 213-2191
Korea	+82 (51) 636-7080
Poland	+48 12 295 13 00
United States	+1 (970) 482-5811

Products Used in Engine Systems

Facility	Phone Number
Brazil	+55 (19) 3708 4800
China	+86 (512) 6762 6727
Germany	+49 (711) 78954-510
India	+91 (124) 4399500
Japan	+81 (43) 213-2191
Korea	+82 (51) 636-7080
The Netherlands	+31 (23) 5661111
United States	+1 (970) 482-5811

Products Used in Industrial Turbomachinery Systems

Facility	Phone Number
Brazil	+55 (19) 3708 4800
China	+86 (512) 6762 6727
India	+91 (124) 4399500
Japan	+81 (43) 213-2191
Korea	+82 (51) 636-7080
The Netherlands	+31 (23) 5661111
Poland	+48 12 295 13 00
United States	+1 (970) 482-5811

Technical Assistance

If you need to contact technical assistance, you will need to provide the following information. Please write it down here before contacting the Engine OEM, the Packager, a Woodward Business Partner, or the Woodward factory:

General

Your Name _____

Site Location _____

Phone Number _____

Fax Number

Prime Mover Information

Manufacturer _____

Turbine Model Number _____

Type of Fuel (gas, steam, etc.) _____

Power Output Rating _____

Application (power generation, marine, etc.)

Control/Governor Information

Control/Governor #1

Woodward Part Number & Rev. Letter _____

Control Description or Governor Type _____

Serial Number

Control/Governor #2

Woodward Part Number & Rev. Letter _____

Control Description or Governor Type _____

Serial Number

Control/Governor #3

Woodward Part Number & Rev. Letter _____

Control Description or Governor Type _____

Serial Number

Symptoms

Description _____

_____

If you have an electronic or programmable control, please have the adjustment setting positions or the menu settings written down and with you at the time of the call.

DVP Cabinet Specifications

General Specifications

Woodward Part Number:	8301-1632
Description:	System- 5 Digital Valve Positioners (DVP)
Power Supply Input:	125 V (dc) +0 %, –28 % (to each DVP—single power input or redundant)
Current Draw:	3 A steady state, 5 A peak for 100 ms (Per DVP.)
Package Heat Dissipation:	40 W nominal per DVP
Dimensions:	(2000 x 800 x 600) mm
Weight:	268 kg (590 lb) 5-DVP Cabinet

Environmental Specifications

Ambient Operating Temperature:	(–10 to +45) °C / (+14 to +113) °F 70 °C (2 hours transient)
Storage Temperature:	(–40 to +75) °C / (–40 to +167) °F
Storage Life:	2 years maximum
Humidity:	0 to 95% non-condensing
Altitude	<3000 m (<9842 ft)
Pollution Degree	II
Ingress Protection:	IP56 per IEC60529
Mechanical Vibration:	Woodward Specification RV5 (0.04 G²/Hz, (10 to 500) Hz, 2 hours/axis, 1.04 Grms)
Mechanical Shock:	Woodward Specification MS2 (30 G, 11 ms half sine pulse)
EMI/RFI Specification:	EN61000-6-2: Immunity for Industrial Environments • IEC 61000-4-2 ESD: ±4kV Contact & ±8kV Air Discharge • IEC 61000-4-3 RF Immunity: 10V/m+AM 80-2700 MHz • IEC 61000-4-4 EFT Immunity: ±1kV Cables, ±2lV power • IEC 61000-4-5 Surge: ±500V DC Power & ±1.0kV I/O • IEC 61000-4-6 CRF: 10V/m+AM 0.150-80 MHz EN61000-6-4: Emissions for Industrial Environments • Radiated & Conducted emissions as applicable Woodward imposed requirements: • Conducted low frequency Immunity 50 Hz to 10 kHz o IACS UR E10 Methods & levels

Revision History

New Manual

Declarations

EU DECLARATION OF CONFORMITY

EU DoC No.:	00603-EU-02-01
Manufacturer's Name:	WOODWARD INC.
Manufacturer's Contact Address:	1041 Woodward Way Fort Collins, CO 80524 USA
Model Name(s)/Number(s):	8301-1632 Cabinet (DVP, RTCnets, & 3rd Party COTS devices) DVP 8200-188 (Qty 5) RTCNet: 8200-1102 AIO (Qty 1), 8200-1104 DIN (Qty 2), & 8200-1105 (Qty 2) 3rd Party COTS: Major items are Solid State Relays, DC-DC Power Supply, Cooling Fan with EMC Filter, Top Ventilation with EMC Filter & IP56-NEMA4 Cabinet
The object of the declaration described above is in conformity with the following relevant Union harmonization legislation:	Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility (EMC) Directive 2014/35/EU on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits
Applicable Standards:	EMC Directive, assembly by analyses 00603-EU-EMC-06-01, to: EN61000-6-4:2007+A1:2011 EMC Part 6-4: Generic Standards - Emissions for Industrial Environments EN61000-6-2:2005 EMC Part 6-2: Generic Standards - Immunity for Industrial Environments Low Voltage Directive to: EN61010-1:2010 Safety Requirements for Electrical Equipment for measurement, control and laboratory use – Part 1: General Requirements
Last two digits of the year in which the CE marking was affixed for the first time:	17

This declaration of conformity is issued under the sole responsibility of the manufacturer
We, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s).

MANUFACTURER

Signature

Joe Driscoll
Full Name

Engineering Manager
Position

Woodward, Fort Collins, CO, USA
Place

1-Nov-2017
Date

5-09-1183 Rev 26

Schneider Electric

DECLARATION OF CONFORMITY

The undersigned, representing the following manufacturer

Company	Schneider Electric USA
Address	1300 South Wolf Road Des Plaines, IL 60018

Here with declares that the products:

Trademark	Magnecraft
Product identification	861 Series Solid State Relays

To which this declaration refers are in conformity with the following:

Standards and/or normative documents	IEC/EN 60947-1:2007, IEC/EN 60947-4-2:2011 " Contactors and motor-starters - AC semiconductor motor controllers and starters" IEC 62314:2006 "Solid State Relays" IEC 61000-4-2:2008 ESD Immunity IEC 61000-4-3:2010 Radiated RF Immunity IEC 61000-4-6:2008 Conducted RF Immunity IEC 61000-4-4:2012 Fast Transient Immunity IEC 61000-4-5:2005 Surge Immunity

Subject to installation, maintenance and use conforming to their intended purpose, regulations, standards, and to the supplier's instructions and rules, meets the provisions of the following EC Directives:

Reference	Title
2006/95/EEC	Low Voltage Directive effective 12.12.2006
2004/108/EC	Electromagnetic Compatibility 12.15.2004

The CE marking on the product and/or the packaging signifies that the product is in compliance with the applicable EU directives.

Des Plaines, IL Date: 11/04/2013

Authorized Signature:

Name: Michael Roller

Title: Engineering manager

EU-Konformitätserklärung / EU Declaration of Conformity

Dri161611000

Wir, / We,

Rittal GmbH & Co. KG • Auf dem Stützelberg • 35745 Herborn

Erklären, dass die Produkte / declare that the products

System-Einzelschränke SE 8 IP 66/NEMA 4
System enclosures SE 8 IP 66/NEMA 4

SE 5830.580 SE 5831.580 SE 5834.580

folgenden Richtlinien entsprechen: / conform to the following Directives

Niederspannungsrichtlinie 2014/35/EU
Low Voltage Directive 2014/35/EU

Angewandte harmonisierte Normen: / Applied harmonised standards

EN 62208
Leergehäuse für Niederspannungs-Schaltgerätekombinationen - Allgemeine Anforderungen (Korrosionsbeständigkeit gemäß Abschnitt 9.13.2.1)
Empty enclosures for low-voltage switchgear and controlgear assemblies - General requirements (corrosion resistance in accordance with section 9.13.2.1)

Herborn, 12.05.2016

Frank Himmelhuber, Geschäftsbereichsleiter FuE
Executive Vice President R&D

Bei einer nicht mit uns abgestimmten Änderung des Produkts verliert diese EG-Konformitätserklärung ihre Gültigkeit.
In case of any amendments to the assembly not explicitly agreed with us, this EC Declaration of Conformity shall be invalidated.

SCHALTSCHRÄNKE STROMVERTEILUNG KLIMATISIERUNG IT-INFRASTRUKTUR SOFTWARE & SERVICE

Seite 1 von 1

FRIEDHELM LOH GROUP

EC Declaration of conformity

Company Address

DBK Technitherm Limited
Unit 11 Llantrisant Business Park
Llantrisant
Rhondda Cynon Taff
South Wales
UK
CF72 8LF

Telephone: (01443) 237927
Fax: (01443) 237867
Email: info@dbkt.co.uk

DBK Technitherm Limited under our sole responsibility declare that the product(s) as listed below

Product category: **Fan Heater**
Model name: **Cirrus 25/1, 25/2, 40/1, 40/2.**

- Conforms with the principal safety objectives of the **European Low Voltage Directive 2006/95/EC,** by application of the following standards:

DIN EN 60335-1:2007-02 EN 60335-1:2002 +A11+A1+A12+Corr.+A2:2006
EN 60335-1/A13:2008
DIN EN 50366:2006-11 ; EN50366:2003+A1:2006

Year of affixation of the CE Marking: 2001

Signed:

Title: DEVELOPMENT DIRECTOR.

Date: 20/09/11.

2938604.CE.04

EG-Konformitätserklärung
EC-Declaration of Conformity

Hersteller / *Manufacturer*: **PHOENIX CONTACT GMBH & CO. KG**

Anschrift / *Address*: Flachsmarktstraße 8, D-32825 Blomberg, Germany

Produktbezeichnung / *Product description*: **QUINT-PS-100-240AC/24DC/10**
(Artikelbezeichnung, / *Article description*,
Artikel-Nr. / *Article no.*) **2938604**

Das vorstehend bezeichnete Produkt stimmt mit den wesentlichen Anforderungen der nachfolgenden Richtlinie(n) und deren Änderungsrichtlinien überein / *The above mentioned product is in line with the essential requirements of the below directive(s) and their modification directive(s):*

2004/108/EC	**EMV-Richtlinie (Elektromagnetische Verträglichkeit)** ***Electromagnetic Compatibility Directive (EMC)***
2006/95/EC	**Niederspannungs-Richtlinie (NSR)** ***Low Voltage Directive (LVD)***

Für die Beurteilung der Übereinstimmung wurden folgende einschlägige Normen herangezogen:
For evaluation of the conformity following relevant standards were consulted:

EN 60950-1:2006/A11:2009/A1:2010	EN 60950-1:2006/A12:2011	EN 50178:1997
EN 61204:1995/A1:2001	EN 61000-3-2:2006/A1:2009/A2:2009	EN 61000-3-3:2008
EN 61000-6-2:2005	EN 61000-6-3:2007/A1:2011	

Weitere Informationen (z. B. Dokumente, Prüfberichte, Einschränkungen, etc.) zur Konformitätsbewertung:
Additional information (for example documents, test reports, restrictions etc.,) of the conformity assessment:

Zertifikate einer benannten Stelle / *Certificates by a notified body*:

Anschrift / *Address*:

Referenz / *Reference*:

Anschrift / *Address*:

Referenz / *Reference*:

Die letzten beiden Ziffern des Jahres in dem die CE-Kennzeichnung angebracht wurde: 13
The last two figures of the year in which the CE marking was applied:
(nur einzutragen, bei der Niederspannungsrichtlinie / *only to be entered on the low voltage directive*)

☒ Diese Erklärung gilt auch für die im Anhang aufgelisteten Produkte. (wenn angekreuzt)
This declaration also applies for the products listed in the annex. (*if marked with a cross*)

Diese Erklärung bescheinigt die Übereinstimmung mit den wesentlichen Anforderungen der genannten Richtlinie(n), enthält jedoch keine Zusicherung von Eigenschaften. Die Sicherheits- und Einbauhinweise der mitgelieferten Produktdokumentation sind zu beachten.
This declaration certifies the conformity with the essential requirements of the indicated directive(s), it does not, however, covenant any characteristics. The instructions for safety and installation of the enclosed product documentation have to be observed.

Blomberg, 2013-11-25

i.A. Werner Meyer
Werner Meyer
Business Unit Power Supplies
Development Power Supplies
Ansprechpartner / contact person

i.V. i.A. Hartmut Henkel
Hartmut Henkel
Business Unit Power Supplies
Head of Power Supplies
Zeichnungsberechtigter / authorized signatory

EG-Konformitätserklärung
Maschinenrichtlinie 2006/42/EG Anhang II A
EC Declaration of Conformity
Machinery Directive 2006/42/EC Annex II A

dri141662600

Hiermit erklären wir, *(We)*

Rittal GmbH & Co. KG, Auf dem Stützelberg, D-35745 Herborn

dass die Filter-Lüfter: *(that the Filter Fans:)*

SK 3237.xxx A) **SK 3238.xxx** A) **SK 3239.xxx** A)
SK 3240.xxx SK 3241.xxx SK 3243.xxx SK 3244.xxx SK 3245.xxx

"xxx" steht für (*applies to*):
100, 109, 110, 124[1], 140, 500, 510, 600, 609, 610

E-Schaltplan, Zusammenbauzeichnung und Beschreibung siehe Montageanleitung
(Wiring diagram, assembly drawing and specification, see assembly instructions)

folgender Richtlinie entspricht: *(conforms to the following Directives)*

Maschinenrichtlinie 2006/42/EG *(Machinery Directive 2006/42/EC)*[2]

Zusätzlich entsprechen die oben genannten Produkte auch folgenden Richtlinien:
(In addition, the above mentioned products also conform to the following Directives)

Elektromagnetische Verträglichkeit 2014/30/EU *(Electromagnetic compatibility 2014/30/EC)*

Angewandte harmonisierte Normen: *(Applied harmonised standards)*

EN ISO 12100	**Sicherheit von Maschinen** *(Safety of machinery)*
EN ISO 13857,	**Sicherheitsabstände gegen das Erreichen von Gefährdungsbereichen mit den oberen und unteren Gliedmaßen** *(Safety distances to prevent hazard zones being reached by upper and lower limbs)*
EN 60335-1	**Sicherheit elektrischer Geräte für den Hausgebrauch und ähnliche Zwecke - Teil 1: Allgemeine Anforderungen** *(Household and similar electrical appliances - Safety - Part 1: General requirements)*
EN 60950-1 A)	**Einrichtungen der Informationstechnik - Sicherheit - Teil 1: Allgemeine Anforderungen** *(Information technology equipment - Safety - Part 1: General requirements)*
EN 61000-6-2:2005	**Elektromagnetische Verträglichkeit (EMV) - Teil 6-2: Fachgrundnormen - Störfestigkeit für Industriebereiche** *(Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments)*
EN 61000-6-4:2007	**Elektromagnetische Verträglichkeit (EMV) - Teil 6-4: Fachgrundnormen - Störaussendung für Industriebereiche** *(Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments)*

Bei einer nicht mit uns abgestimmten Änderung der Maschine verliert diese EG-Konformitätserklärung ihre Gültigkeit.
This declaration of EC conformity shall become null and void when the assembly is subjected to any modification that has not met with our approval.

Verantwortlich für Dokumentation
(Responsible for documentation)

Rittal GmbH & Co. KG
Auf dem Stützelberg
D-35745 Herborn

Herborn, 29.02.2016

Frank Himmelhuber, Bereichsleiter FuE
Senior Vice President R&D

[1] 24 VDC Version; nicht nach NspRL 2006/95/EG *(does not conform to LVD 2006/95/EC)*

[2] Die Konformitätsbewertung nach der Maschinenrichtlinie schließt gemäß Anhang I, Nummer 1.5.1 die Schutzziele der Niederspannungsrichtlinie ein.
The conformity assessment according to Annex I, 1.5.1 of the Machinery Directive includes the safety objectives of the Low Voltage Directive.

FRIEDHELM LOH GROUP

Id.-Nr. 327499
D-0000-00000193

EU-Konformitätserklärung

EU Declaration of Conformity

dri161781300

Wir **Rittal GmbH & Co. KG**
We Postfach 16 62
35726 Herborn
Germany

erklären, dass das Produkt
declare that the product

Schaltschrank-Innentemperaturregler **SK 3110.000**
Temperature controller for electronic cabinets

mit den Bestimmungen der folgenden Richtlinien übereinstimmt:
is conform to the provisions of:

2014/35/EU Niederspannungsrichtlinie
Low Voltage Directive
2014/30/EU EMV-Richtlinie
EMC Directive
2011/65/EU RoHS-Richtlinie
Hazardous Substances Directive

Angewendete harmonisierte Normen:
Applied harmonised standards:

EN 60730-1:2011
Automatische elektrische Regel- und Steuergeräte für den Hausgebrauch und ähnliche Anwendungen - Teil 1: Allgemeine Anforderungen
Automatic electrical controls for household and similar use - Part 1: General requirements

EN 60730-2-9:2010
Automatische elektrische Regel- und Steuergeräte für den Hausgebrauch und ähnliche Anwendungen - Teil 2-9: Besondere Anforderungen an temperaturabhängige Regel- und Steuergeräte
Automatic electrical controls for household and similar use - Part 2-9: Particular requirements for temperature sensing controls

Herborn, 18.04.2016

Frank Himmelhuber, Geschäftsbereichsleiter FuE
Executive Vice President R&D

Bei einer nicht mit uns abgestimmten Änderung des Produkts verliert diese EG-Konformitätserklärung ihre Gültigkeit.
In case of any amendments to the assembly not explicitly agreed with us, this EC Declaration of Conformity shall be invalidated.

SCHALTSCHRÄNKE STROMVERTEILUNG KLIMATISIERUNG IT-INFRASTRUKTUR SOFTWARE & SERVICE

FRIEDHELM LOH GROUP

Released

We appreciate your comments about the content of our publications.

Send comments to: icinfo@woodward.com

Please reference publication 35090.

B 3 5 0 9 0 : -

WOODWARD

PO Box 1519, Fort Collins CO 80522-1519, USA
1041 Woodward Way, Fort Collins CO 80524, USA
Phone +1 (970) 482-5811

Email and Website—www.woodward.com

Woodward has company-owned plants, subsidiaries, and branches, as well as authorized distributors and other authorized service and sales facilities throughout the world.

Complete address / phone / fax / email information for all locations is available on our website.