

dametric 

# ADDENDUM TO RMS-RS1 / SD WITH THE AGS SENSOR



Valmet 

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## 1 GENERAL

The RMS-RS1 SD system can be upgraded with the adjustable gap sensor AGS, to get improved accuracy and in-production calibration of the sensor.

This manual describes the changes in the system and it also lists the new units.

### 1.1 Differences between the TDC-system and the AGS-system

#### RMS-RS1 SD with the TDC sensor

The sensors are named TDC-xxx.

The DCM-RM1 board can have any revision number.

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The KB-02 is used as a cable box for the sensor.

The TVD-T1/T2 sensors are used.

The K-TVDS25 cable is used to the TVD sensors.

The K-TDC25 cable is used between the rack and the KB-02 connection box.

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The K-GTS is used between the connection box and the TDC sensor.

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#### RMS-RS1 SD with the AGS sensor

The sensors are named AGS-xxx.

The DCM-RM1 boards must have a software revision number of 1.60 or higher, "AgsReady".

A Panel-PC is added, PPC-84T4.

A CEC-DM1 unit, a CAN-Ethernet-Converter, is used and mounted on a DIN-rail close to the rack.

A 24V AC/DC power supply is added to power the ACM, Panel-PC and the AGS sensor.

The KB-AGS1R is used as cable box.

The TVD-sensor is built in inside the AGS-sensor so the TVD-T1/T2 sensors are excessive.

The K-TVDS25 cable is used but now connected to the KB-AGS1R cable box.

The K-TDC25 cable is also used together with the AGS-sensor.

The cable K-AGP25 is added between the ACM-RM1 board and the KB-AGS1R box.

The cable K-CAN1P25 is added between the ACM-RM1 board and the KB-AGS1R box.

The K-AGS3 is used between the connection box and the AGS sensor.

A crossed ethernet cable, K-UTP5X3, is used between the CEC-DM1 unit and the Panel-PC.

A new cable, K-CANRMS-RSSD, is used to connect the CAN-bus between the DCM-RM1, the ACM-DM1 and to the CEC-DM1 converter.

## 1.2 New connections and devices

The PPC-84T4 is an 8.4" Panel-PC with a touch screen. It is used for calibration of the AGS sensor, to modify parameters, to view an alarm log or to check the signal trend. The unit is mounted in the front of the panel and should be mounted in a convenient height above the floor.

CEC-DM1 is a new device which translates data from the CAN-bus to UDP, an IP-based protocol used in the Panel-PC. The CEC-DM1 is mounted on a standard DIN-rail.

The ACM-RM1 unit is used as an interface toward the AGS sensor. The unit also includes digital inputs and outputs (24VDC), and analogue inputs and outputs (4-20mA). The unit is mounted on a DIN-rail.

A 24VDC power supply is needed to provide power to the ACM, CEC, PPC and to the AGS sensor. A standard commercial AC/DC supply with 100W output power (4A) is sufficient, mounted preferably on the DIN-rail.

## 1.3 The Panel-PC

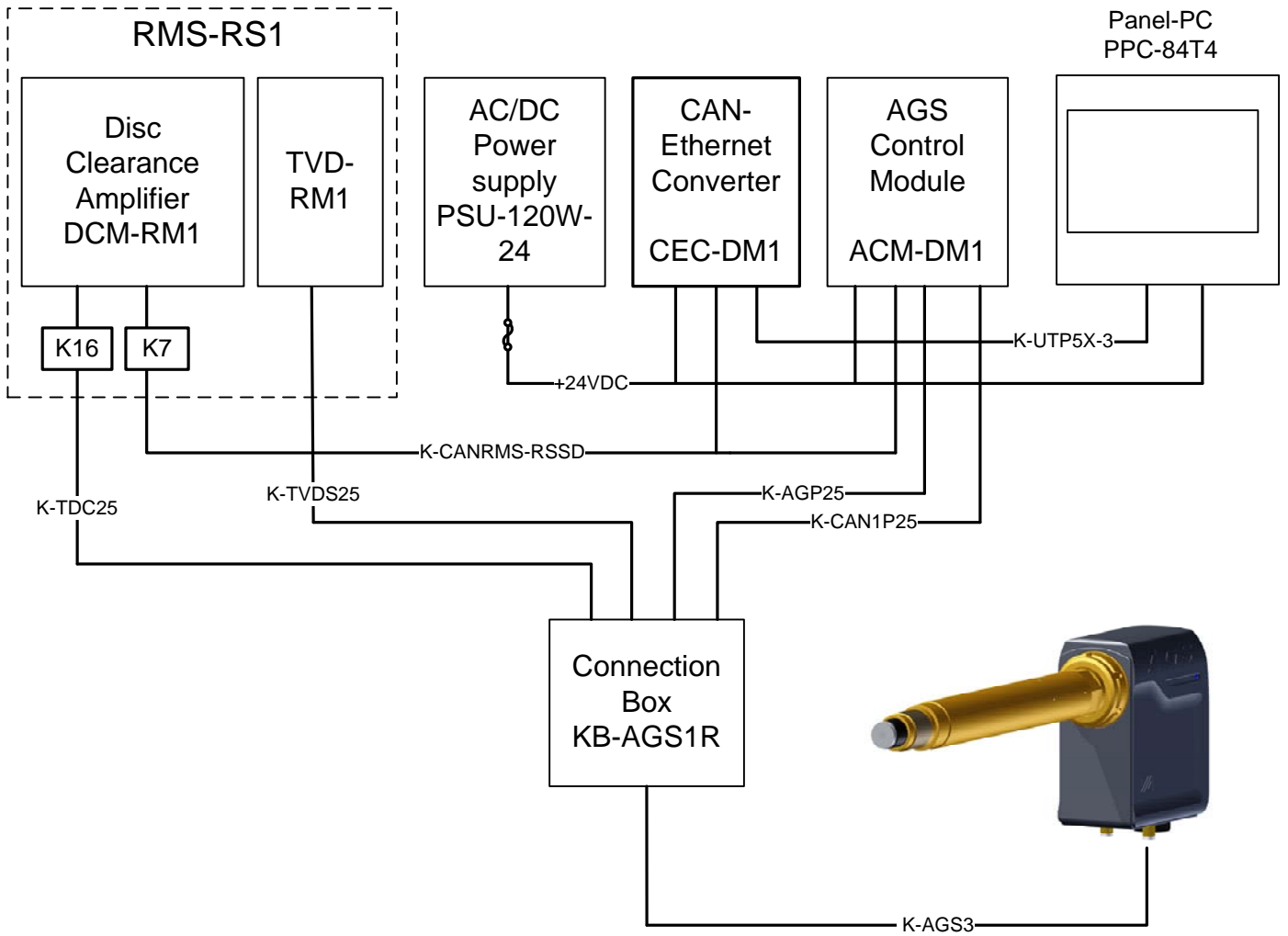
A GmsWin program is loaded into the Panel-PC and presents the status and values for the RMS system. The unit is also used to calibrate the AGS-sensor, for service of the units and to change the parameters for the new functionality.

A separate manual, AGS-RMS-RS1-SD, describes the menus and how to use the Panel-PC.

The settings of the limits for the RMS units are however done the same way as before, by adjusting the potentiometers on the units and then check the result on the DCM-RM1.

## 2 CONNECTIONS

### 2.1 System overview



## 2.2 Connections ACM-DM1

### 2.2.1 K1 – 24V and internal CAN

|      |        |                                      |
|------|--------|--------------------------------------|
| K1/1 | +24VDC | Positive power supply input          |
| K1/2 | 0V     | Negative power supply input          |
| K1/3 | CANH   | K-CANRMS-RSSD: white-blue            |
| K1/4 | CANL   | K-CANRMS-RSSD: blue-white            |
| K1/5 | CANR   | Connect to K1/4 for 120Ω termination |
| K1/6 | 0V     | Ground                               |

### 2.2.2 K2 – External CAN to AGS

|        |      |                       |
|--------|------|-----------------------|
| K2/1   | CANH | K-CAN1P25: white-blue |
| K2/1   | CANL | K-CAN1P25: blue-white |
| K2/3-6 | N.C. | not used              |

### 2.2.3 K3 – Analogue input

|        |       |                              |
|--------|-------|------------------------------|
| K3/1-2 | N.C.  | not used                     |
| K3/3   | AnIn+ | Positive signal input 4-20mA |
| K3/4   | AnIn- | Negative signal input 4-20mA |

### 2.2.4 K4 – Digital inputs and outputs

|      |       |  |
|------|-------|--|
| K4/1 | +24VD | Supply output for digital inputs   |
| K4/2 | Din 1 | Digital input 1, Node<br>1 = Node 2 (connect to K4/1), 0 = Node 1 (leave open)               |
| K4/3 | Din 2 | Digital input 2, FeedGuard<br>1 = Activated, 0 = Not activated                               |
| K4/4 | Din 3 | Digital input 3, Touch position<br>1 = Activated (idle cal.), 0 = Not activated (prod. cal.) |
| K4/5 | Dout1 | Digital output, AGS Sum alarm<br>1 = No alarm, 0 = Sum alarm                                 |
| K4/6 | Dout2 | Digital output, AGS Calibration on<br>1 = Calibration in progress, 0 = No calibration        |
| K4/7 | Dout3 | Digital output, AGS Calibrated<br>1 = Calibrated (ready for production), 0 = Not calibrated  |
| K4/8 | 0V    | 0V reference for digital inputs  |

## 2.3 Connections CEC-DM1

### 2.3.1 K1 – 24V

|      |        |                             |
|------|--------|-----------------------------|
| K1/1 | +24VDC | Positive power supply input |
| K1/2 | +24V   | Not used                    |
| K1/3 | 0V     | Not used                    |
| K1/4 | 0V     | Negative power supply input |

### 2.3.2 K2 –CAN

|      |      |                                      |
|------|------|--------------------------------------|
| K2/1 | CANH | K-CANRMS-RSSD: white-blue            |
| K2/2 | CANL | K-CANRMS-RSSD: blue-white            |
| K2/3 | CANR | Connect to K2/3 for 120Ω termination |
| K2/4 | 0V   | Not used                             |

**2.4 Connections to the RMS-RS1 rack**

The only connection to the RMS-RS1 rack is the internal CAN-bus. The cable K-CANRMS-RSSD connects the CAN between the ACM, CEC and the DCM-RM1 unit in the RMS rack. Connect the cable to the K7 connector on the RMS-RS1 rack (see circuit diagram).

**2.5 Digital inputs**

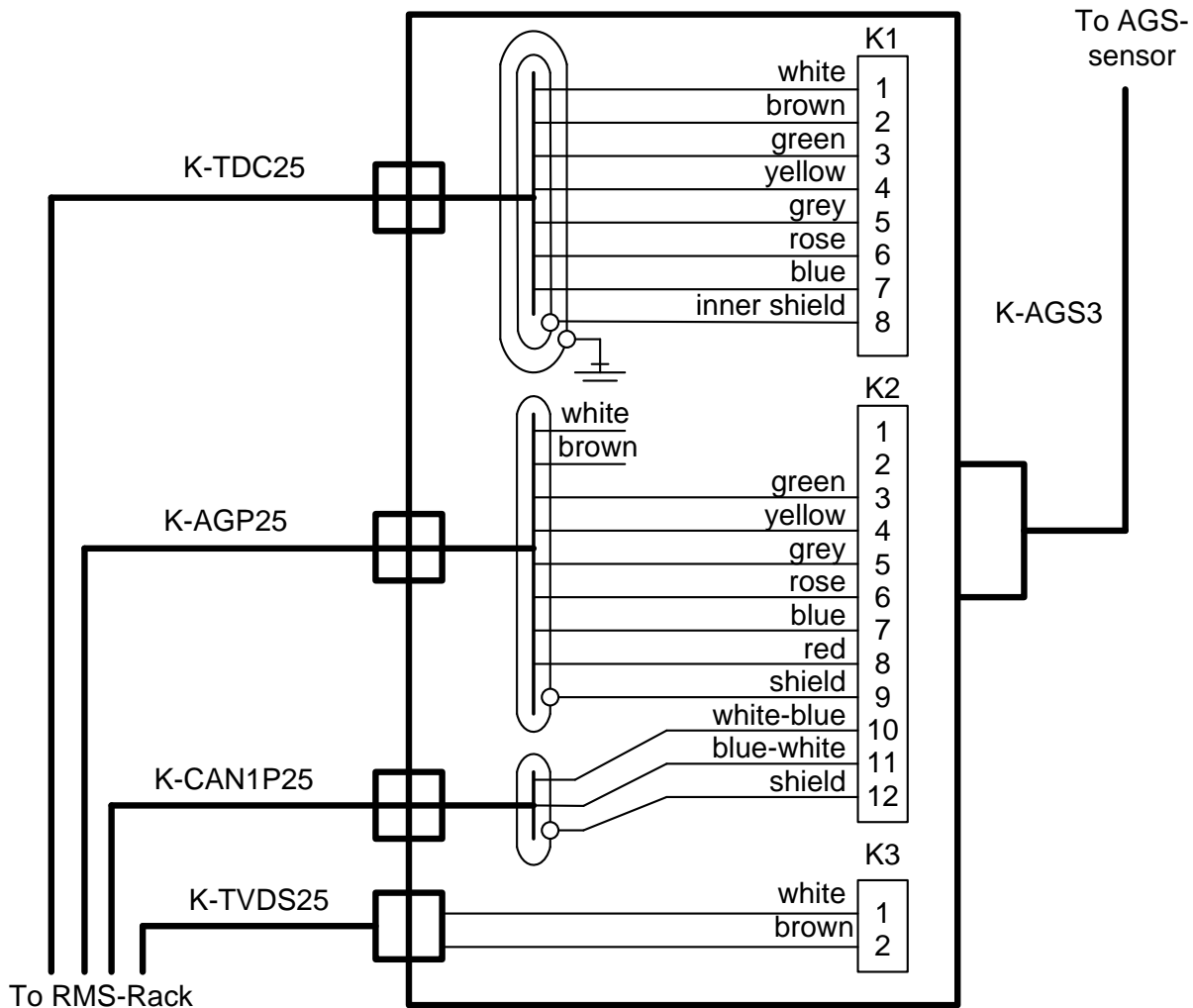
One to three digital inputs can be used in the system. Use DIN-bar mounted PLC relays for isolation and connect the relays outputs to the ACM unit.

**2.6 Digital outputs**

One to three digital outputs can be used in the system. Use DIN-bar mounted PLC relays for isolation and connect the relay coil inputs to the ACM unit (see circuit diagram).

**2.7 Connections to the KB-AGS1R**

The connection box is mounted on the refiner stand and joints the cables from the electronic panel to the detachable cable to the AGS sensor. The cables are connected as follows:



**2.8 Connections to the AGS-xxx sensor**

The armed K-AGS3 cable is connected between the AGS sensor and the connection box. The cable has connectors in each end which makes it easy to replace.

## 2.9 Connections to the PLC

An output has been added to enable the PLC logic to determine if the AGS sensor is calibrated or not. The output is found on the PLC relay K01 "Dout1" and is a logic high (24Vdc) as long as the AGS-sensor is calibrated.

The output drops if the measuring tip of the sensor is changed, if the AGS-sensor is changed or if the corresponding DCA-card in the rack has been switched.

The calibration procedure will set the output high if the sensor is first coarse calibrated and then calibrated in the refiner while running in idling mode.

## 3 THE PANEL-PC

The Panel-PC handles the interface between the operator and the system. It serves as a display of the measured parameters in the refiner and is also used when calibrating the AGS-sensor or when changing any of the AGS-specific parameters of the system.

The functions of the Panel-PC are described in a separate manual.

The calibration of the AGS-sensor is described in another manual.

## 4 AGS PART LIST

| <i>Dametric part.no.</i> | <i>Valmet part.no.</i> | <i>Description</i>                     |
|--------------------------|------------------------|--|
| AGS-HM-H4                | VAL0320980             | AGS Head                               |
| AGS-XP-S...              | VAL...                 | AGS Tip (depending of refiner type)    |
| AGS-SP-...               | VAL...                 | AGS Holder (depending of refiner type) |
| PPC-84T4                 | VAL0337127             | Panel-PC                               |
| PPC-SP4                  | VAL0342350             | PPC mounting plate (2 pcs)             |
| CEC-DM1                  | VAL0219209             | Can-Ethernet-Conv                      |
| KB-AGS1R                 | VAL0196736             | Connection box                         |
| K-AGS3                   | VAL0196735             | AGS-KB Cable                           |
| K-TDC25                  | VAL0122970             | TDC Cable                              |
| K-AGP25                  | VAL0196888             | AGS Cable                              |
| K-CAN1P25                | VAL0219213             | CAN Cable                              |
| AGS-SP-CS1               | VAL0322341             | AGS Air Cooling System                 |
| AGS-SH1                  | VAL0296266             | AGS Service holder                     |

## 5 ABBREVIATIONS

This table can be useful to understand some of mentioned names and abbreviations.

**CE**™. Operative system from Microsoft.

**RMS**, *Refiner Monitoring System*, equipment used for measuring and controlling the refiner.

**AGS**, *Adjustable Gap Sensor*, a plate gap sensor based on the TDC-principle where the measuring tip can be axially adjusted.

**TDC**, *True Disc Clearance*, the distance from the sensor tip to the rotor plates.

**APO**, *Ags Position*, the position of the sensor tip relative to the flush position. Range  $\pm 2.50$  mm.

**TVD**, *Touchpoint Vibration Detector*, the vibration amplitude signal generated when the sensor tip touches the rotor while rotating.

**TED**, *Touchpoint Electric Detector*, the signal generated when the sensor tip touches the rotor by measuring the resistance between the AGS tip and the rotor.

The TVD and TED signals are both used to establish the touch point for zero-calibration the sensor.



**Plate Gap**, *the true plate gap*, defined as the TDC + APO. If the tip is moved toward the rotor, the TDC value will decrease, the APO will increase but the plate gap will remain constant. The benefit of this is to perform a calibration during calibration and thereby avoiding production loss.

**DCM-RM1**, *Disc Clearance Monitor*, a unit for measuring the plate gap mounted in the RMS-RS1 rack.

**ACM-DM1**, *AGS Control module*, an interface for the AGS sensor.

**CEC-DM1**, *Can-Ethernet-Converter*, a unit to translate data from the CAN-bus to UDP, an IP-based protocol used in the Panel-PC. The CEC-DM1 is mounted on a standard DIN-rail.

**CAN**, *Control Area Network*, a standard field bus.

## 6 CONTACT

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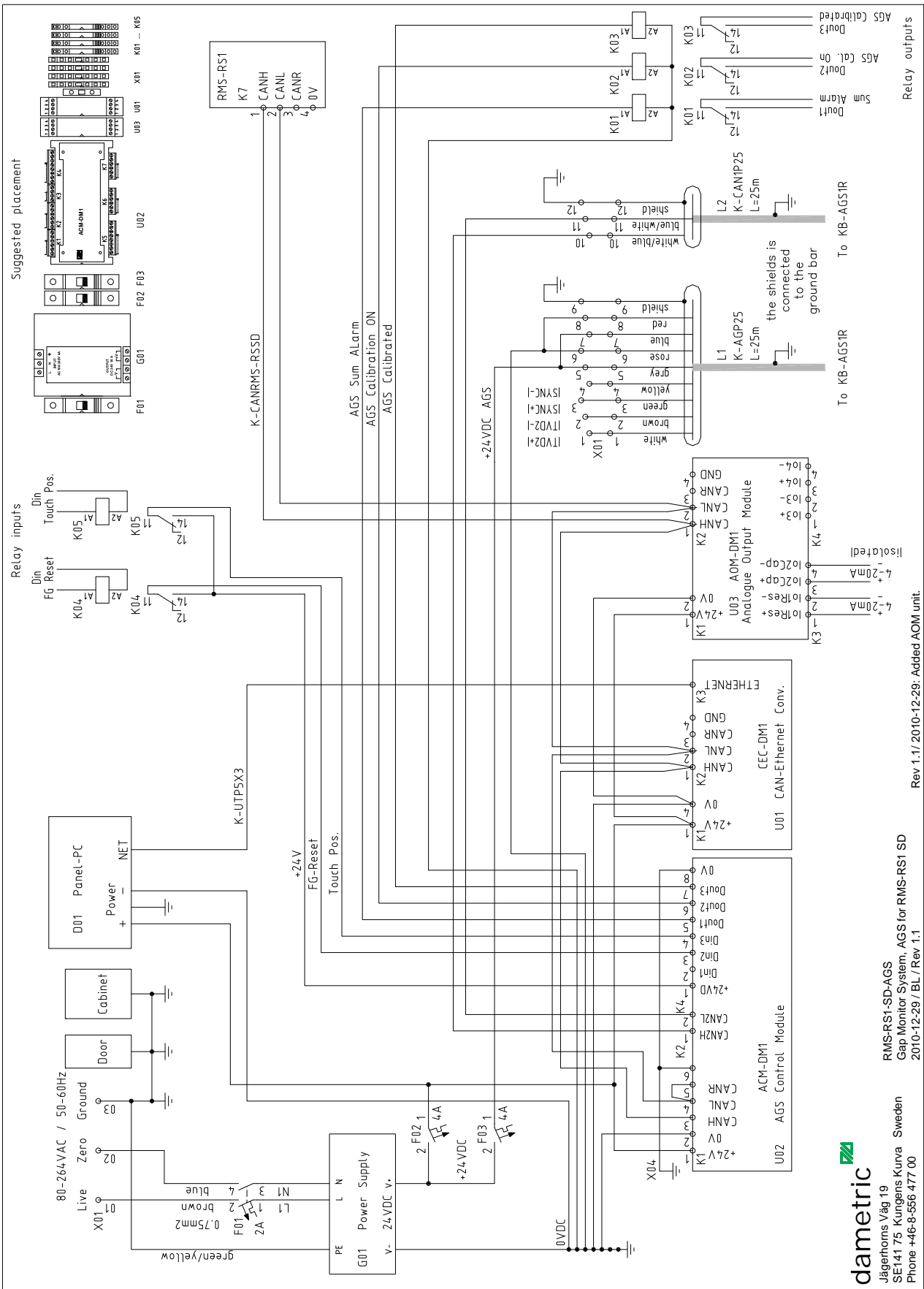
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# 7 CONNECTION DIAGRAM



Rev 1.1/2010-12-29: Added AOM unit.

RMS-RS1-SD-AGS  
Gap Monitor System, AGS for RMS-RS1 SD  
2010-12-29 / BL / Rev 1.1

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