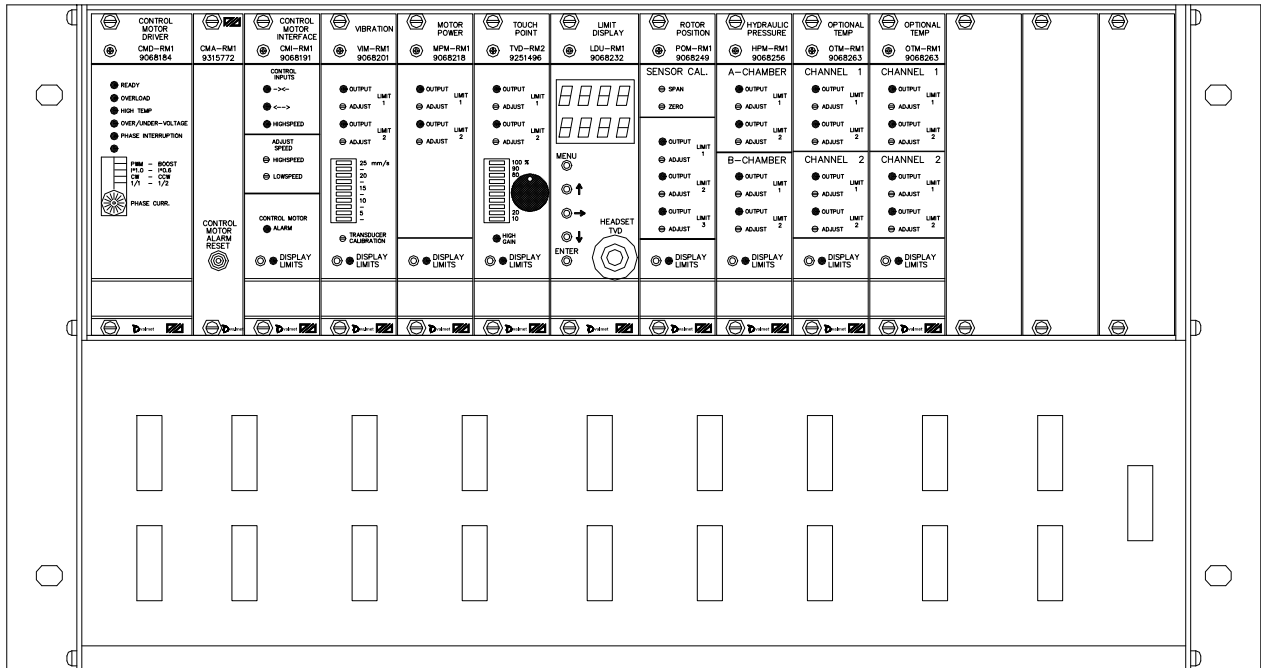




RMS-EX1

VAL0123042 / SKC9068177



REFINER MONITOR SYSTEM – EX EXPANDABLE RACK USERS MANUAL



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1. TECHNICAL SPECIFICATION

System voltage:	+24 Vdc, $\pm 10\%$, max 2.0 A
Operating temperature:	0 - 55 C
Storage temperature:	-40 to +70 °C
Air humidity:	F according to DIN 40 040 (15% to 95% not condensing)
Protection:	IP00 (no protection against dust or water)
Mounting:	Mounting with 4 pcs M6 screws on a vertical mounting plate in a protecting cabinet
Digital outputs:	Voltage: 24Vdc Type: Active high (PNP) output from +24V system voltage Isolation: 500V, galvanic isolated from the respective unit Load: Max 50mA
Digital inputs:	Voltage: 24Vdc Type: Active high with resistor to 0V system voltage Isolation: 500V, galvanic isolated from the respective unit Impedance: 5 k Ω Trip voltage: 12 ± 5 V
Serial output:	RS-485 to display unit
Analog outputs:	Current: 4-20mA Isolation: 500V, galvanic isolated Load: Max 800 Ω
Analog inputs:	Current: 4-20mA Isolation: ± 200 V relative internal units Impedance: Max 200 Ω
Connecting cables:	Detachable screw connectors, max 2.5mm ² cable area Cable shields is connected direct to the ground bar
Grounding:	The rack is grounded through the ground cable
CE-approval:	According to EN 50081-2:1993, EN 50082-2:1995, 89/336/EEC Test report: Enator TR976011

2. CONTACT

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Valmet 

3. INTERNAL UNITS IN THE RACK

<i>Function</i>	<i>Dametric article no.</i>	<i>Metso VAL no.</i>	<i>SKC article no.</i>
Rack	RMS-EX1	VAL0123042	SKC 9068177
Control Motor Driver	CMD-RM2	VAL0173903	SKC 9101601
Control Motor Interface	CMI-RM1	VAL0122828	SKC 9068191
Vibration Monitor	VIM-RM1	VAL0123136	SKC 9068201
Motor Power Monitor	MPM-RM1	VAL0122978	SKC 9068218
Touch Point Vib. Detector	TVD-RM3	VAL0123117	SKC 9251496
Limit Display Unit	LDU-RM1	VAL0122977	SKC 9068232
Position Monitor	POM-RM1	VAL0123032	SKC 9068249
Hydraulic Pressure Mon.	HPM-RM1	VAL0122850	SKC 9068256
Optional Temp Monitor	OTM-RM1	VAL0122982	SKC 9068263
Cover Fronts	TP-36		

4. EXTERNAL UNITS

<i>Function</i>	<i>Dametric article no.</i>	<i>Metso VAL no.</i>	<i>SKC article no.</i>
Cable VIM	K-VIMS25	VAL0122973	SKC 9691135
Transducer VIM	VIM-T2	VAL0116214	SKC 9691128
Cable TVD	K-TVDS25	VAL0122971	SKC 9305689
Transducer TVD	TVD-T2 (40kHz)	VAL0098485	SKC 9069798
	or TVD-T2S (10kHz)	VAL0111167	SKC 9175400
	or TVD-T3 (30kHz)	VAL0111167	SKC 9175400
Headset TVD	IR-HS		SKC 8448365
Cable POM	K-POT25	VAL0122963	SKC 9069815
Transducer POM	POT-50	VAL0103227	SKC 9069808
Display	POI-50	VAL0123030	SKC 9068287
	or PDU-RM3	VAL0122989	SKC 9194852
	or Operators Panel		

5. DESCRIPTION OF THE UNITS

RMS-EX1

Power supply :	24 Vdc +/- 10%, max 2.0 A, from an external power unit.
Internal connectors:	1 each 32-pole and 6 each 64-pole pcb-connectors type C, for the internal units
External connectors:	4, 6, 8 and 12-pole terminal blocks for external signals

Rack RMS-EX

CMD-RM2

Control Motor Driver

Function:	Current driver for stepping motor controlling the rotor position
Power supply:	24-32 Vdc, 4.5A
Input:	Control signals from the CMI-RM1 unit
Output:	Drive currents for 2-phase electric stepping motor
Cable:	K-CM25 or K-CM25K, 4*1.5 mm ² , 25 m

CMI-RM1

Control Motor Interface

Function:	Converts control signals from the PLC-system to clock- and direction signals to the CMD-RM1/CMD-RM2 unit.
Digital inputs:	Plates Together, Plates Apart and High speed
Digital Outputs:	Alarm control motor

VIM-RM1	Vibration Monitor
Function:	The transducer measures the refiner vibration
Transducer:	Accelerometer 1 to 6000 Hz
Digital outputs:	Limit 1, Limit 2
Analog output 1:	4-20 mA
Analog output 2:	Led ramp in the front of the unit, 0-25 mm/s, 10 leds
Cable:	K-VIMS25, 2-pole connector, 4-pole cable+double shield, 0.25 mm ² , 25m
MPM-RM1 or MPM-RM2	Motor Power Monitor
Function:	Monitor the current signal indicating the main motor load
Digital Outputs:	Limit 1, Limit 2, Limit 3 (Limit 3 only MPM-RM2)
Analog input:	4-20 mA
Analog output:	4-20 mA
TVD-RM3	Touchpoint Vibration Detector
Function:	Excitates and measure the signal from an accelerometer transducer The transducer measures the refiner touch point vibration
Gain setting:	Potentiometer in the front of the unit to set production gain
Digital input:	Low gain
Digital outputs:	Limit 1, Limit 2
Transducer:	TVD-T2, TVD-T2S or TVD-T3
Analog output 1:	4-20 mA dc current signal
Analog output 2:	Audio ac-signal to headset
Analog output 3:	Spare
Analog output 4:	Led ramp in the front of the unit, 0-100%, 10 leds
Cable:	K-TVDS25, 4-pole connector, 4-pole cable +shield, 0.25 mm ² , 25m
LDU-RM1	Limit Display Unit
Function:	Display-unit for the adjustment of the limits and monitoring of the signals. Supervision of the rotor position travel due to the feed guard reset. Electronic RMC.
Digital inputs:	Feed guard reset, Feed guard alarm reset, RMC Touch Point
Digital outputs:	Unit ready, Feed guard contact, Feed guard alarm, RMC Ready, RMC Start Pos
Display:	4-digit LED-display: level/limit 4-digit LED-display: channel / limit / function
POM-RM1	Position Monitor
Function:	Excitates and measures the transducer for rotor position
Digital outputs:	Limit 1, Limit 2, Limit 3
Transducer:	POT-50
Analog output:	4-20 mA
Cable:	K-POT25, 7-pole connector, 7-pole cable +shield, 0.25 mm ² , 25m
External display:	POI-50, display only the POM value
or	PDU-RM3, displays the POM, TVD, VIM and MPM value
or	Operators panel

HPM-RM1**Hydraulic Pressure Monitor**

Function: Excites and measures the transducers for hydraulic pressure
The unit measures both the A- and the B-chamber side

Transducers: 2-wire Pressure transducer 4-20 mA

Digital outputs: A-Limit 1, A-Limit 2, B-Limit 1, B-Limit 2

Analog outputs: A: 4-20 mA, B: 4-20 mA

OTM-RM1**Optional Temp Monitor**

Function: Excites and measures 2 transducers for temperature measurement
The unit can be set (by dip-settings) to 0-100 °C or 0-200 °C

Transducers: 3-wire PT-100 transducer

Digital outputs: CH1: Limit 1, CH1: Limit 2, CH2: Limit 1, CH2: Limit 2

Analog outputs: CH1: 4-20 mA, CH2:4-20 mA

EX-1

Function: Spare card slot for either of following units:

OTM-RM1	Optional Temperature Monitor
HPM-RM1	Hydraulic Pressure Monitor
POM-RM1	Position Monitor
TVD-RM3	Touch Point Vibration Detector
MPM-RM1/2	Motor Power Monitor
VIM-RM1	Vibration Monitor
HPM-RM1	Safeset supervision Monitor

EX-2

Function: Same as EX-1.

EX-3

Function: Spare card slot for future use. The front panel width is reduced to 25 mm (5TE).

Connectors: 6-pole + 8-pole screw connectors.

6. PRINCIPAL OF ADJUSTMENT

See the calibration manual (CAL-EX) for a more detailed description.

Adjustment of the alarm limits is done on the respective unit.

Read-out of alarm limits and levels is done on the Limit Display Unit, LDU-RM1.

The upper row indicates the actual value and the lower row indicates the number of the channel and the limit.

Each RMS unit is selected by the push-button "DISPLAY LIMITS" on the unit. The different values/limits is selected by the push buttons on the display unit. The "↑" and the "↓" buttons do selections. The measured values/limits will appear in the following order.

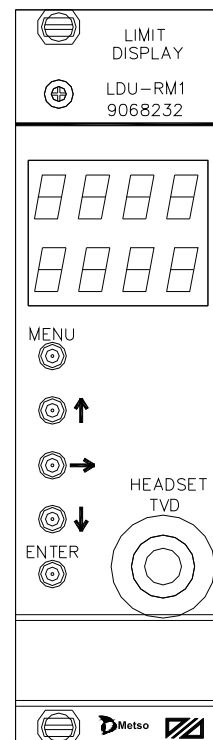
CHANNEL 1	Measured level, channel 1	
LIMIT 1	Alarm limit 1 (channel 1)	
LIMIT 2	Alarm limit 2 (channel 1)	
LIMIT 3	Alarm limit 3 (channel 1)	(if available)
CHANNEL 2	Measured level, channel 2	(if available)
LIMIT 1	Alarm limit 1 (channel 2)	(if available)
LIMIT 2	Alarm limit 2 (channel 2)	(if available)

Automatically turn-off function

The display is automatically turned off approx. 2 minutes after the last activated "DISPLAY LIMITS".

To cancel this function, push any of the "→" buttons. The lower right decimal point will then light up.

Next activation of any of the "DISPLAY LIMITS", reactivates the turn-off function.



7. CONNECTION DIAGRAM

K11 CONTROL MOTOR POWER Power Supply

CM+U	1 ●	+24-35 Vdc
CM+U	2 ●	+24-35 Vdc
CM-GND	3 ●	0 V (control motor chassis)
CM-GND	4 ●	0 V (control motor chassis)

K12 CONTROL MOTOR DRIVER Electric stepping motor power supply

CM+W1A	1 ●	Positive, phase 1	K-CM25	white
CM-W1E	2 ●	Negative, phase 1	or	brown
CM+W2A	3 ●	Positive, phase 2	K-CM25K	green
CM-W2E	4 ●	Negative, phase 2		yellow
CM+W3A	5 ●			
CM-W3E	6 ●	Connect the cable shield to the ground bar below the RMS-rack		
CM+W4A	7 ●			
CM-W4E	8 ●			
CM+W5A	9 ●			
CM-W5E	10 ●			
CM-GND	11 ●			
CM-GND	12 ●			

K21 RMS POWER

Us+	1 ●	+24 Vdc
Us+	2 ●	+24 Vdc
Us-	3 ●	0 V
Us-	4 ●	0 V

K22 CONTROL MOTOR INTERFACE Digital inputs and outputs

DI+CMTO	1 ●	Digital input, Plates Together	PLC
DI+CMAP	2 ●	Digital input, Plates Apart	PLC
DI+CMHS	3 ●	Digital input, High Speed	PLC
DI+CMHT	4 ●	Digital input, Holding Torque	PLC
DO+CMAL	5 ●	Digital output, Stepping Motor Alarm	PLC
DO+CM	6 ●	Digital output, Spare	PLC

K31**VIM and MPM Analog inputs and outputs**

AO+VIM	1 ●	Analog output, 4-20 mA	Instrum. system
AO-VIM	2 ●	Analog output, 4-20 mA	Instrum. system
AI+MPM	3 ●	Analog input, 4-20 mA	Instrum. system
AI-MPM	4 ●	Analog input, 4-20 mA	Instrum. system
AO+MPM	5 ●	Analog output, 4-20 mA	Instrum. system
AO-MPM	6 ●	Analog output, 4-20 mA	Instrum. system

K32**VIM and MPM Digital outputs**

DO+VIM1	1 ●	Digital output, VIM, Limit 1	PLC
DO+VIM2	2 ●	Digital output, VIM, Limit 2	PLC
DO+MPM1	3 ●	Digital output, MPM, Limit 1	PLC
DO+MPM2	4 ●	Digital output, MPM, Limit 2	PLC

K33**VIM Transducer signals**

T+VIM	1 ●	Transducer, positive	K-VIMS25 : white+brown green+yellow
T-VIM	2 ●	Transducer, negative	
TS-VIM	3 ●	Connect the outer shield to the ground bar below the RMS-rack. The inner shield should not be connected and be isolated. It must be kept separated from the outer shield.	
	4 ●		

K41**TVD Headset output, Analog outputs, Digital outputs, Digital input**

AO+TVDHS	1 ●	Headset output	Headset
AO-TVDHS	2 ●	Headset output	Headset
AO+TVD	3 ●	Analog output, 4-20 mA	Instrum. system
AO-TVD	4 ●	Analog output, 4-20 mA	Instrum. system
DO+TVD1	5 ●	Digital output, Limit 1	PLC
DO+TVD2	6 ●	Digital output, Limit 2	PLC
DI+LOGA	7 ●	Digital input, Low Gain	PLC
DO+MPM3	8 ●	Digital output, Limit 3, MPM	PLC

K42 TVD Transducer signals, Sync input, Spare output

T+TVD	1 ●	Transducer, positive	K-TVDS25 : white+brown
T-TVD	2 ●	Transducer, negative	green+yellow
TS-TVD	3 ●	Connect the cable shield to the ground bar below the RMS-rack	
T+TVDS	4 ●	Sync. input, positive	Not used
T-TVDS	5 ●	Sync. input, negative	Not used
AO+TVDA	6 ●	Analog output, spare	Not used
AO-TVDA	7 ●	Analog output, spare	Not used
	8 ●		

K43 LDU Digital inputs and outputs

DI+LDU1	1 ●	Digital input, (DI-TPMA) RMC Touch Point	PLC
DI+LDU2	2 ●	Digital input, LDU 2	Not used
DO+LDU3	3 ●	Digital output, (DO+RMCRD) RMC Ready	PLC
DO+LDU4	4 ●	Digital output, (DO+RMCPSP) RMC Start Pos	PLC
DO+LDURD	5 ●	Digital output, LDU Ready	PLC
ID+SCI1	6 ●	Digital output, Serial Com. Interface	Not used
ID+SCI2	7 ●	Digital output, Serial Com. Interface	Not used
ID-SCI	8 ●	Digital output, Serial Com. Interface	Not used

K44 LDU Digital inputs and outputs

DI+FGRE	1 ●	Digital input, Feed Guard Reset	PLC
DO+FGCO	2 ●	Digital output, Feed Guard Contact	PLC
DO+FGAL	3 ●	Digital output, Feed Guard Alarm	PLC
ID+PDU1	4 ●	Serial output	4 (see below)
ID+PDU2	5 ●	Serial input	5
ID-PDU	6 ●	Serial common	6
U+PDU	7 ●	Power supply, +24V	7
U-PDU	8 ●	Power supply, 0V,	8
		Socket	Cable K-PDU3
		4	white
		5	brown
		6	green+shield
		7	yellow
		8	grey
			Cable to Operators panel
			white
			brown
			green
			not connected
			not connected

K51**POM Transducer signals**

TI-POT	1 ●	Transducer, input positive	K-POT25: white
TI+POT	2 ●	Transducer, input negative	K-POT25: brown
TE-POT	3 ●	Transducer, input common	K-POT25: green
TE+POT	4 ●	Transducer (not used)	K-POT25: yellow
TR+POT	5 ●	Transducer, excitation positive	K-POT25: grey
TM+POT	6 ●	Transducer, excitation negative	K-POT25: rose
TS-POT	7 ●	(switch white and brown for reversed indication)	
	8 ●	Connect the cable shield to the ground bar below the RMS-rack	

K52**POM Analog outputs, Digital outputs**

AO+POM	1 ●	Analog output, POM, 4-20 mA	Instrum. system
AO-POM	2 ●	Analog output, POM, 4-20 mA	Instrum. system
DO+POM1	3 ●	Digital output, POM Limit 1	PLC
DO+POM2	4 ●	Digital output, POM Limit 2	PLC
DO+POM3	5 ●	Digital output, POM Limit 3	PLC
	6 ●		

K53**HPM Transducer signals**

T+HPMA	1 ●	Transducer, A-Chamber, positive	
T-HPMA	2 ●	Transducer, A-Chamber, negative	
TS-HPMA	3 ●	Connect the cable shield to the ground bar below the RMS-rack	
T+HPMB	4 ●	Transducer, B-Chamber, positive	
T-HPMB	5 ●	Transducer, B-Chamber, negative	
TS-HPMB	6 ●	Connect the cable shield to the ground bar below the RMS-rack	

K54**HPM Analog outputs, Digital outputs**

AO+HPA	1 ●	Analog output, HPM-A, 4-20 mA	Instrum. system
AO-HPA	2 ●	Analog output, HPM-A, 4-20 mA	Instrum. system
AO+HPB	3 ●	Analog output, HPM-B, 4-20 mA	Instrum. system
AO-HPB	4 ●	Analog output, HPM-B, 4-20 mA	Instrum. system
DO+HPA1	5 ●	Digital output, HPM-A Limit 1	PLC
DO+HPA2	6 ●	Digital output, HPM-A Limit 2	PLC
DO+HPB1	7 ●	Digital output, HPM-B Limit 1	PLC
DO+HPB2	8 ●	Digital output, HPM-B Limit 2	PLC

K61**OTM 1 Transducer signals**

T+OTM11	1 ●	Transducer 1-1, positive
T-OTM11	2 ●	Transducer 1-1, compensation
TS-OTM11	3 ●	Transducer 1-1, negative
T+OTM12	4 ●	Transducer 1-2, positive
T-OTM12	5 ●	Transducer 1-2, compensation
TS-OTM12	6 ●	Transducer 1-2, negative

Connect the cable shield to the ground bar below the RMS-rack

K62**OTM 1 Analog outputs, Digital outputs**

AO+OTM11	1 ●	Analog output 1-1, 4-20 mA	Instrum. system
AO-OTM11	2 ●	Analog output 1-1, 4-20 mA	Instrum. system
AO+OTM12	3 ●	Analog output 1-2, 4-20 mA	Instrum. system
AO-OTM12	4 ●	Analog output 1-2, 4-20 mA	Instrum. system
DO+OTM11	5 ●	Digital output, 1-1, Limit 1	PLC
DO+OTM12	6 ●	Digital output, 1-1, Limit 2	PLC
DO+OTM13	7 ●	Digital output, 1-2, Limit 1	PLC
DO+OTM14	8 ●	Digital output, 1-2, Limit 2	PLC

K63**OTM 2 Transducer signals**

T+OTM21	1 ●	Transducer 2-1, positive
T-OTM21	2 ●	Transducer 2-1, compensation
TS-OTM21	3 ●	Transducer 2-1, negative
T+OTM22	4 ●	Transducer 2-2, positive
T-OTM22	5 ●	Transducer 2-2, compensation
TS-OTM22	6 ●	Transducer 2-2, negative

Connect the cable shield to the ground bar below the RMS-rack

K64**OTM 2 Analog outputs, Digital outputs**

AO+OTM21	1 ●	Analog output 2-1, 4-20 mA	Instrum. system
AO-OTM21	2 ●	Analog output 2-1, 4-20 mA	Instrum. system
AO+OTM22	3 ●	Analog output 2-2, 4-20 mA	Instrum. system
AO-OTM22	4 ●	Analog output 2-2, 4-20 mA	Instrum. system
DO+OTM21	5 ●	Digital output, 2-1, Limit 1	PLC
DO+OTM22	6 ●	Digital output, 2-1, Limit 2	PLC
DO+OTM23	7 ●	Digital output, 2-2, Limit 1	PLC
DO+OTM24	8 ●	Digital output, 2-2, Limit 2	PLC

K71**EX 1 Example with the SSM-RM1 card**

EX-711	1 ●	Transducer +	K-AT10: white
EX-712	2 ●	Transducer M, Motor side	K-AT10: brown
EX-713	3 ●	Transducer R, Refiner side	K-AT10: green
EX-714	4 ●	Transducer -	K-AT10: yellow
EX-715	5 ●		
EX-716	6 ●		

K72 EX 1 Example with the SSM-RM1 card

EX-721	1 ●	Digital output, Not used	PLC
EX-722	2 ●	Digital output, Safeset rotating	PLC
EX-723	3 ●	Digital output, Safeset tripped	PLC
EX-724	4 ●	Digital input, Reset Safeset	PLC
EX-725	5 ●		
EX-726	6 ●	Connect the cable shield to the ground bar below the RMS-rack	
EX-727	7 ●		
EX-728	8 ●		

K73 EX 2 Not used

EX-731	1 ●
EX-732	2 ●
EX-733	3 ●
EX-734	4 ●
EX-735	5 ●
EX-736	6 ●

K74 EX 2 Not used

EX-741	1 ●
EX-742	2 ●
EX-743	3 ●
EX-744	4 ●
EX-745	5 ●
EX-746	6 ●
EX-747	7 ●
EX-748	8 ●

K75**EX 3 Not used**

EX-751

1 ●

EX-752

2 ●

EX-753

3 ●

EX-754

4 ●

EX-755

5 ●

EX-756

6 ●

K76**EX 3 Not used**

EX-761

1 ●

EX-762

2 ●

EX-763

3 ●

EX-764

4 ●

EX-765

5 ●

EX-766

6 ●

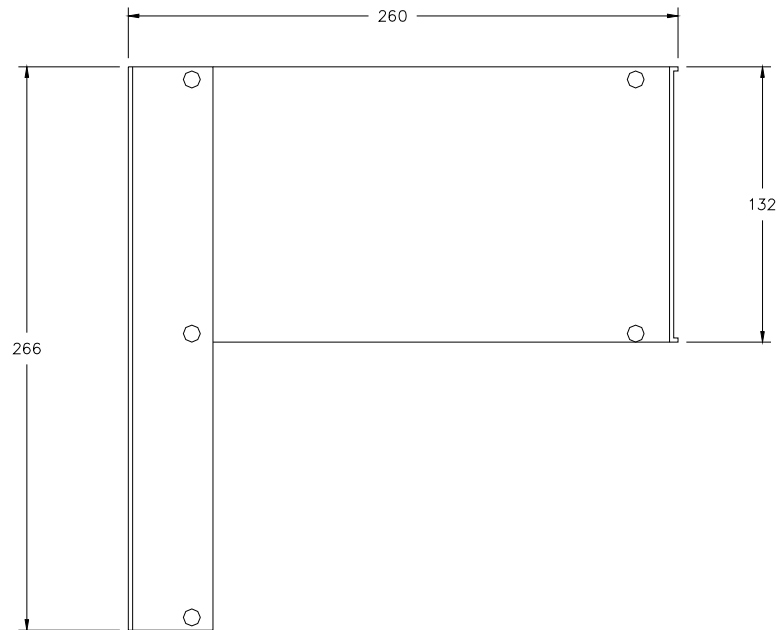
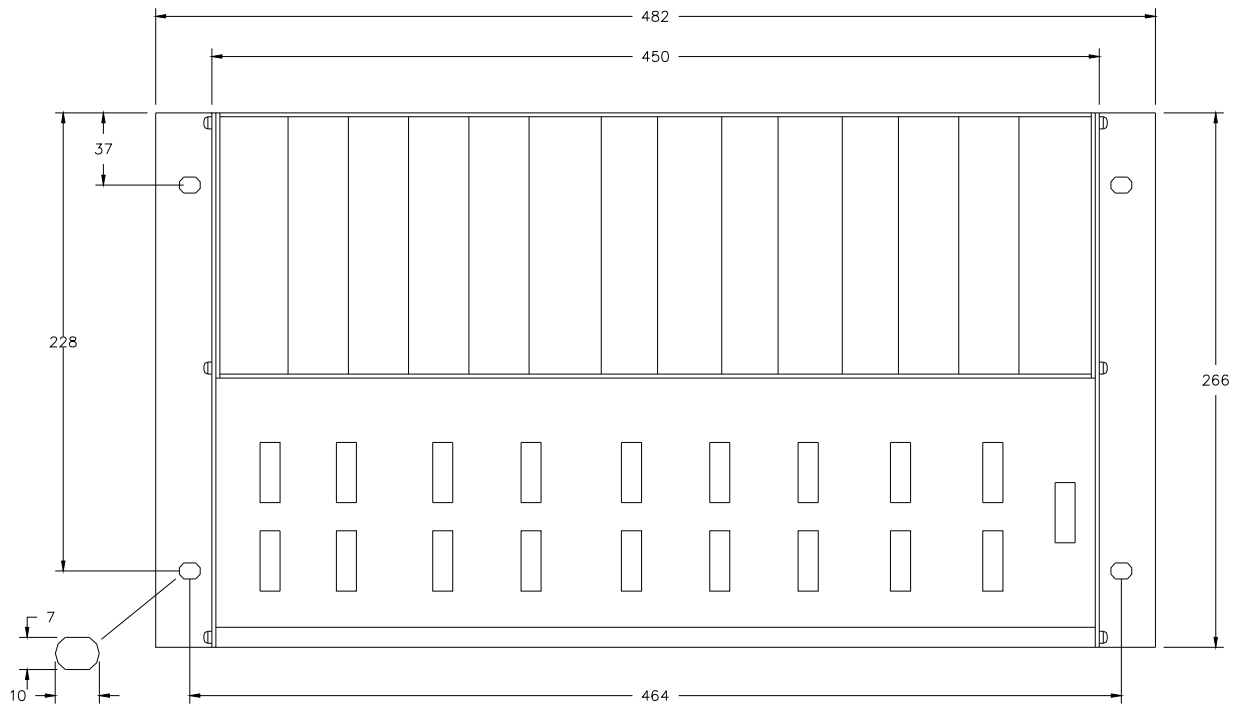
EX-767

7 ●

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8. OUTLINE DRAWING



9. CONNECTION DRAWING

