Accreditation Scope

Etihad Airways Engineering L.L.C, NAL 169
Calibration Laboratory, (ISO/IEC 17025:2017)

Abu Dhabi Airport Building, Airport Road - Abu Dhabi, UAE

Issue Date: 26-10-2021 **Expiry Date: 25-10-2024**

Issue No: 01

Calibration Field/ Quantity/ Property	Measurand / Equipment	Measuring Range	CMC (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)
Electrical (Source)	DC Current	(0.1 to 0.3) mA	0.08 µA	EYEng-Cal-Ele-002:2021	P
		(> 0.3 – 3) mA	5.8 µA		
		(> 3 – 30) mA	6.8 µA		
		(> 30 – 300) mA	39 µA		
		(> 0.3 – 3) A	5.9 mA		
		(> 3 – 10) A	8.6 mA		
		(> 10 – 20) A	26 mA		
		(>20 to 50) A	0.37 A		
		(>50 to 100) A	0.37 A		
		(>100 to 250) A	0.84 A		
		(>250 to 500) A	1.6 A		
		(>500 to 750) A	2.4 A		
		(>750 to 1000) A	5.0 A		
	AC Current	(100 to 330) µA		EYEng-Cal-Ele-002:2021	P
		(10 to 20) Hz	0.88 µA		
		(>20 to 45) Hz	0.69 µA		
		>45 Hz to 1 kHz	0.59 µA		
		(>1 to 5) kHz	1.3 µA		
		(>5 to 10) kHz	3.3 µA		
		(>10 to 30) kHz	6.6 µA		
		(> 0.33 to 3.3) mA			
		(10 to 20) Hz	9.7 µA		
		(>20 to 45) Hz	7.5 µA		
		>45 Hz to 1 kHz	7.0 µA		
		(>1 to 5) kHz	9.8 µA		
		(>5 to 10) kHz	20 µA		
		(>10 to 30) kHz	40 µA		

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Electrical (Source)	AC Current	(> 3.3 to 33) mA			EYEng-Cal-Ele-002:2021	P
		(10 to 20) Hz		0.07 mA		
		(>20 to 45) Hz		0.04 mA		
		>45 Hz to 1 kHz		0.02 mA		
		(>1 to 5) kHz		0.03 mA		
		(>5 to 10) kHz		0.08 mA		
		(>10 to 30) kHz		0.16 mA		
		(> 33 to 330) mA				
		(10 to 20) Hz		0.72 mA		
		(>20 to 45) Hz		0.38 mA		
		>45 Hz to 1 kHz		0.20 mA		
		(>1 to 5) kHz		0.45 mA		
		(5 to 10) kHz		0.90 mA		
		(> 0.33 to 1.1) A				
		(10 to 45) Hz		12 mA		
		(>45 Hz to 1 kHz		6.0 mA		
		(>1 to 5) kHz		10 mA		
		(>5 to 10) kHz		37 mA		
		(> 1.1 to 3) A				
		45 Hz to 1 kHz		6.2 mA		
		(>1 to 5) kHz		23 mA		
		(> 3 to 11) A				
		(45 to 100) H		14 mA		
		>100 Hz to 1) kHz		18 mA		
		(>1 to 5 kHz		0.38 A		

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Electrical (Source)	AC Current	(> 11 to 20) A		EYEng-Cal-Ele-002:2021	P
		(45 to 100) Hz	0.04 A		
		>100 Hz to 1 kHz	0.04 A		
		(>1 to 5) kHz	0.70 A		
	AC Current @ 50 Hz	(20 to 50) A	0.29 A	EYEng-Cal-Ele-002:2021	P
		(>50 to 100) A	0.46 A		
		(>100 to 250) A	0.99 A		
		(>250 to 500) A	1.9 A		
		(>500 to 750) A	2.8 A		
		(>750 to 1000) A	5.0 A		
	DC Voltage	(10 to 300) mV	8.7 µV	EYEng-Cal-Ele-002:2021	P
		(> 0.3 – 3) V	0.05 mV		
		(> 3 – 30) V	0.49 mV		
		(> 30 – 300) V	7.0 mV		
		(> 300 – 1000) V	24 mV		
	AC Voltage	(10 to 33) mV		EYEng-Cal-Ele-002:2021	P
		(10 to 45) Hz	0.07 mV		
		>45 Hz to 10 kHz	0.02 mV		
		(>10 to 20) kHz	0.03 mV		
		(>20 to 50) kHz	0.08 mV		
		(>50 to 100) kHz	0.26 mV		
		(>100 to 500) kHz	0.63 mV		
		(> 33 to 330) mV			
		(10 to 45) Hz	0.22 mV		
		>45 Hz to 10 kHz	0.11 mV		
		(>10 to 20) kHz	0.12 mV		
		(>20 to 50) kHz	0.25 mV		
		(>50 to 100) kHz	0.60 mV		
		(>100 to 500) kHz	1.5 mV		

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Electrical (Source)	AC Voltage	(> 0.33 to 3.3) V		EYEng-Cal-Ele-002:2021	P
		(10 to 45) Hz	2.1 mV		
		>45 Hz to 10 kHz	1.1 mV		
		(>10 to 20) kHz	1.4 mV		
		(>20 to 50) kHz	2.1 mV		
		(>50 to 100) kHz	4.9 mV		
		(> 3.3 to 33) V			
		45 Hz to 10 kHz	11 mV		
		(>10 to 20) kHz	17 mV		
		(>20 to 50) kHz	24 mV		
		(>50 to 100) kHz	63 mV		
		(> 33 to 330) V			
		45 Hz to 1 kHz	0.60 V		
		(>1 to 10) kHz	0.15 V		
		(> 330 to 1000) V			
		45 Hz to 1 kHz	0.63 V		
		(>1 to 5) kHz	0.53 V		
		(>5 to 10) kHz	0.63 V		
	Resistance	(1 to < 11) Ω	2.6 mΩ	EYEng-Cal-Ele-002:2021	P
		(11 to < 33) Ω	3.0 mΩ		
		(33 to < 110) Ω	5.0 mΩ		
		(110 to < 330) Ω	14 mΩ		
		(0.33 to < 1.1) kΩ	0.05 Ω		
		(1.1 to < 3.3) kΩ	0.12 Ω		
		(3.3 to < 11) kΩ	0.39 Ω		
		(11 to < 33) kΩ	1.3 Ω		
		(33 to < 110) kΩ	3.8 Ω		
		(110 to < 330) kΩ	15 Ω		
		(0.33 to < 1.1) MΩ	46 Ω		

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Electrical (Source)	Resistance	(1.1 to < 3.3) MΩ	0.29 kΩ	EYEng-Cal-Ele-002:2021	P
		(3.3 to < 11) MΩ	1.7 kΩ		
		(11 to < 33) MΩ	12 kΩ		
		(33 to < 110) MΩ	69 kΩ		
		(110 to < 330) MΩ	1.2 MΩ		
		(0.33 to 1) G	19 M		
	Capacitance	(0.5 – 10) nF	0.04 nF	EYEng-Cal-Ele-002:2021	P
		(> 10 – 100) nF	0.41 nF		
		(> 0.1 – 1) µF	7.0 nF		
		(> 1 – 10) µF	0.04 µF		
		(> 10 – 100) µF	0.66 µF		
		(> 0.1 – 1) mF	8.0 µF		
		(> 1 – 10) mF	0.06 mF		
		(> 10 – 100) mF	1.5 mF		
	Frequency	(1 – 120) Hz	1 mHz	EYEng-Cal-Ele-002:2021	P
		(> 0.12 - 1.2) kHz	0.06 Hz		
		(> 1.2 – 12) kHz	0.07 Hz		
		(> 12 – 120) kHz	0.36 Hz		
		(> 0.12 - 1.2) MHz	0.06 kHz		
		(> 1.2 – 2) MHz	0.06 kHz		
	DC Power	Volt: (1 V up to 1 kV) Current: (0.1 mA up to 20 A)		EYEng-Cal-Ele-002:2021	P
		(1 – 330) W	0.19 W		
		(> 0.33 – 3) kW	1.9 W		
		(> 3 – 20) kW	30 W		

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Electrical (Source)	AC Power	Volt: (1 V up to 1 kV) Current: (0.1 mA up to 20 A) Frequency: (1 kHz)		EYEng-Cal-Ele-002:2021	P
		(1 – 330) W (> 0.33 – 3) kW (> 3 – 20) kW	2.7 W 0.05 kW 0.9 kW		
	Oscilloscope	DC VOLTS = 5 V @ 50 Ω		EYEng-Cal-Ele-002:2021	P
		(1 – 10) mV (> 10 – 100) mV (> 100 – 500) mV (> 0.5 – 1) V (> 1 – 2) V (> 2 - 5) V	0.08 mV 0.34 mV 1.5 mV 2.9 mV 5.9 mV 20 mV		
		DC VOLTS: 100 V @ 1 MΩ			
		(1 – 10) mV (> 10 – 100) mV (> 100 – 500) mV (> 0.5 – 1) V (> 1 – 10) V (> 10 - 100) V	0.06 mV 0.11 mV 0.34 mV 0.63 mV 5.9 mV 59 mV		
		Frequency leveled Sine wave 9 mV to 5.5 V @ 50 Ω			
		50 kHz (> 0.05 to 100) MHz (> 100 to 300) MHz (> 300 to 600) MHz	0.76 mV 0.76 mV 0.76 mV 0.50 mV		
		Frequency leveled Sine wave 9 mV to 3.5 V @ 50 Ω			
		(> 600 to 1100) MHz	0.50 mV		

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Electrical (Source)	Oscilloscope	Frequency Bandwidth		EYEng-Cal-Ele-002:2021	P
		50 kHz up to 1.1 GHz	14 mHz		
	Insulation Tester	100 kΩ 500 kΩ 1 MΩ 10 MΩ 100 MΩ 1 GΩ	0.11 kΩ 0.08 kΩ 0.06 kΩ 0.13 MΩ 1.4 MΩ 0.06 GΩ	EYEng-Cal-Ele-002:2021	P
Electrical (Measure)	DC Current	(1 – 10) mA (> 10 – 100) mA (> 0.1 – 1) A (> 1 – 3) A (> 3 – 10) A	8.2 µA 0.12 mA 5.8 mA 7.3 mA 61 mA	EYEng-Cal-Ele-001:2021	P
	AC Current	(10 – 100) µA		EYEng-Cal-Ele-001:2021	P
		10 Hz to 5 kHz (5 to 10) kHz	0.31 µA 1.3 µA		
		(> 0.1 – 1) mA			
		10 Hz to 5 kHz (5 to 10) kHz	2.0 µA 6.0 µA		
		(> 1 – 100) mA			
		10 Hz to 5 kHz (5 to 10) kHz	0.18 mA 0.54 mA		
		(> 100 – 400) mA			
		10 Hz to 1 kHz (1 to 10) kHz	0.95 mA 4.2 mA		
		(> 0.4 – 1) A			
		10 Hz to 5 kHz (5 to 10) kHz	2.2 mA 12 mA		

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Electrical (Measure)	AC Current	(>1 – 3) A		EYEng-Cal-Ele-001:2021	P
		10 Hz to 5 kHz (5 to 10) kHz	9.0 mA 37 mA		
		(>3 – 10) A			
		10 Hz to 5 kHz (5 to 10) kHz	25 mA 0.12 A		
	DC Voltage	(0.1 – 1) V (> 1 – 10) V (> 10 – 100) V (>100 – 1000) V	9.8 µV 0.09 mV 1.2 mV 12 mV	EYEng-Cal-Ele-001:2021	P
		(10 – 100) mV			
		(40 Hz to 1000) Hz (>1 to 20) kHz (>20 to 100) kHz (>100 to 300) kHz	11 µV 19 µV 95 µV 0.36 mV		
		(> 0.1 – 1) V			
		(40 to 1000) Hz (>1 to 20) kHz (>20 to 50) kHz (>50 to 100) kHz (>100 to 300) kHz (>300 to 500) kHz	0.59 mV 0.62 mV 0.69 mV 1.1 mV 3.6 mV 12 mV		
		(> 1 – 10) V			
		(40 Hz to 1000) Hz (>1 to 20) kHz (>20 to 50) kHz (>50 to 100) kHz (>100 to 300) kHz (>0.3 to 1) MHz	1.4 mV 2.0 mV 3.8 mV 9.5 mV 36 mV 0.12 V		

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Electrical (Measure)	Ac voltage	(> 10 – 100) V		EYEng-Cal-Ele-001:2021	P
		(40 to 1000) Hz (>1 to 20) kHz (>20 to 50) kHz (>50 to 100) kHz	27 mV 39 mV 47 mV 0.14 V		
		(> 100 – 750) V			
		40 Hz to 1 kHz (>1 to 20) kHz (>20 to 50) kHz (>50 to 100) kHz	0.49 V 0.72 V 1.4 V 3.5 V		
		(> 750 – 1000) V			
		45 Hz	3.5 V		
	Resistance	(> 10 – 100) Ω (> 0.1 – 1) kΩ (> 1 – 10) kΩ (> 10 – 100) kΩ (> 0.1 – 1) MΩ (> 1 – 10) MΩ (> 10 – 100) MΩ	2.0 mΩ 13 mΩ 0.12 Ω 1.4 Ω 23 Ω 0.74 kΩ 70 kΩ	EYEng-Cal-Ele-001:2021	P
	Capacitance	(1 – 10) nF (> 10 – 100) nF (> 0.1 – 1) µF (> 1 – 10) µF (> 10 – 100) µF (> 0.1 – 1) mF (> 1 – 10) mF (> 10 – 100) mF	0.17 nF 1.7 nF 0.02 µF 0.18 µF 1.8 µF 0.02 mF 0.18 mF 4.9 mF	EYEng-Cal-Ele-001:2021	P
	Frequency	(1 to 40) Hz >40 Hz to 10 MHz	0.02 mHz/Hz 0.12 mHz/Hz	EYEng-Cal-Ele-001:2021	P

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Time	Timer, Stopwatch	1 s up to 1 h	0.60 s	EYEng-Cal-Ele-003:2021	P
Electrical (Source)	Temperature Simulation (K type)	(-200 to -100) °C (> -100 to 0) °C (> 0 to 120) °C (> 120 to 1370) °C	0.41°C 0.24 °C 0.20 °C 0.48 °C	EYEng-Cal-Ele-004:2021	P
	Temperature Simulation (J type)	(-210 to -0) °C (> 0 to 400) °C (> 400 to 1200) °C	0.41°C 0.24 °C 0.20 °C	EYEng-Cal-Ele-004:2021	P
		(-200 to 0) °C (> 0 to 1170) °C	0.60 °C 0.50 °C	EYEng-Cal-Ele-004:2021	S
	Temperature Simulation (R type)	(-40 to 0) °C (> 0 to 600) °C (> 600 to 1740) °C	3.5 °C 1.2 °C 1.2 °C	EYEng-Cal-Ele-004:2021	S
		(1 to 400) °C (> 400 to 1760) °C	0.69 °C 0.51 °C	EYEng-Cal-Ele-004:2021	P
	Temperature Simulation (S type)	(-40 to 0) °C (> 0 to 600) °C (> 600 to 1730) °C	3.5 °C 1.3 °C 1.2 °C	EYEng-Cal-Ele-004:2021	S
		(1 to 400) °C (> 400 to 1760) °C	0.57 °C 0.56 °C	EYEng-Cal-Ele-004:2021	P
	Temperature Simulation (K type)	(-200 to -100) °C (> -100 to 0) °C (> 0 to 300) °C (> 300 to 900) °C (> 900 to 1300) °C	0.60 °C 0.59 °C 0.50 °C 0.59 °C 0.59 °C	EYEng-Cal-Ele-004:2021	S

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Electrical (Source)	Temperature Simulation (T type)	(-200 to -100) °C (> -100 to 0) °C (> 0 to 100) °C (> 100 to 200) °C (> 200 to 390) °C	1.2 °C 1.2 °C 0.37 °C 0.37 °C 0.36 °C	EYEng-Cal-Ele-004:2021	P/S
	Temperature Simulation (E type)	(-200 to 0) °C (> 0 to 500) °C (> 500 to 980) °C	0.6 °C 0.3 °C 0.25 °C		
	Temperature Simulation (N type)	(-200 to 0) °C (> 0 to 1240) °C	1.2 °C 0.5 °C		
	Temperature Simulation (T type)	(-100 to 590) °C	0.72 °C		
	Temperature Simulation (RTD Pt100)	(-190 to -100) °C (> -100 to 0) °C (> 0 to 160) °C (> 160 to 500) °C (> 500 to 830) °C	0.27 °C 0.27 °C 0.27 °C 0.47 °C 1.2 °C		
	Temperature Simulation (RTD Pt200)	(-190 to 0) °C (> 0 to 830) °C	0.22 °C 0.95 °C		
	Temperature Simulation (RTD Pt500)	(-190 to 0) °C (> 0 to 830) °C	0.4 °C 0.93 °C		
	Temperature Simulation (RTD Pt1000)	(-190 to 0) °C (> 0 to 390) °C	0.4 °C 0.53 °C		

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Electrical (Measure)	Temperature Simulation (K type)	(-200 to -100) °C (> -100 to 0) °C (> 0 to 300) °C (> 300 to 900) °C (> 900 to 1300) °C	0.60 °C 0.59 °C 0.36 °C 0.59 °C 0.59 °C	EYEng-Cal-Ele-004:2021	P/S
	Temperature Simulation (J type)	(-200 to 1170) °C	0.6°C		
	Temperature Simulation (T type)	(-200 to -100) °C (> -100 to 0) °C (> 0 to 100) °C (> 100 to 200) °C (> 200 to 390) °C	1.2 °C 1.2 °C 0.36 °C 0.36 °C 0.36 °C		
	Temperature Simulation (R type)	(-40 to 0) °C (> 0 to 600) °C (> 600 to 1740) °C	3.5 °C 1.2 °C 1.2 °C		
	Temperature Simulation (S type)	(-40 to 0) °C (> 0 to 600) °C (> 600 to 1730) °C	3.5 °C 1.3 °C 1.2 °C		
	Temperature Simulation (E type)	(-200 to 0) °C (> 0 to 500) °C (> 500 to 980) °C	0.59 °C 0.3 °C 0.3 °C		
	Temperature Simulation (N type)	(-200 to 0) °C (> 0 to 1240) °C	1.2 °C 0.48 °C		
	Temperature Simulation (U type)	(-100 to 590) °C	0.7 °C		

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Accreditation Scope

Etihad Airways Engineering L.L.C, NAL 169
Calibration Laboratory, (ISO/IEC 17025:2017)

Abu Dhabi Airport Building, Airport Road - Abu Dhabi, UAE

Issue Date: 26-10-2021 **Expiry Date: 25-10-2024**

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Calibration Field/ Quantity/ Property	Measurand / Equipment	Measuring Range	CMC (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)
Electrical (Measure)	Temperature Simulation (RTD Pt100)	(-190 to -100) °C (> -100 to 0) °C (> 0 to 160) °C (> 160 to 500) °C (> 500 to 830) °C	0.18 °C 0.18 °C 0.18 °C 0.3 °C 0.92 °C	EYEng-Cal-Ele-004:2021	P/S
	Temperature Simulation (RTD Pt200)	(-190 to 0) °C (> 0 to 830) °C	0.14 °C 0.58 °C		
	Temperature Simulation (RTD Pt500)	(-190 to 0) °C (> 0 to 830) °C	0.25 °C 0.36 °C		
	Temperature Simulation (RTD Pt1000)	(-190 to 0) °C (> 0 to 390) °C	0.18 °C 0.21 °C		
Temperature & Humidity	Thermo Hygrometer Relative Humidity	20 % RH to 70 % RH (15 – 60) °C	1 % RH 0.3 °C	EYEng-Cal-Tmp-001:2021	P
Temperature	Air Temperature Sensors	(15 to 60) °C	0.3 °C	EYEng-Cal-Tmp-001:2021	P
	Thermometers Thermo couples Temperature Transmitter Temperature Sensors	(-30 to 0) °C	0.07 °C	EYEng-Cal-Tmp-003:2021	P/S
		(> 0 to 155) °C	0.07 °C		
		(> 155 to 400) °C	0.21 °C		
		(> 400 to 660) °C	0.29 °C		
	Infrared Thermometer	(35 to 300) °C	1 %	EYEng-Cal-Tmp-005:2021	P

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Temperature	Climate Chamber (e.g. Chiller, Freezer, Incubator, oven, Furnace, Hot Cabinet Hot Box..etc) (1, 5 or 9 Point Calibration)	(-30 to 650) °C	1.2 °C	EYEng-Cal-Tmp-006:2021	S
Dimensional	Calipers	(0.5 – 600) mm	31 µm	EYEng-Cal-Dim-002:2020	P
		(>600 – 1000) mm	40 µm		
		(>1000 – 1500) mm	50 µm		
	External Micrometer	(0.5 – 25) mm	2.5 µm	EYEng-Cal-Dim-001:2020	P
		(>25 – 50) mm	3 µm		
		(>50 – 75) mm	3.5 µm		
		(>75 – 100) mm	4 µm		
		(>100 – 500) mm	10 µm		
		(> 0.5 – 1) m	20 µm		
		(>1 – 1.5) m	27 µm		
	Dial Test Indicator Dial Gauge	(0.01 - 60) mm	3 µm	EYEng-Cal-Dim-003:2020	P
	Dial Test Indicator Dial Gauge (Lever type)	(0.01 - 3) mm	2 µm	EYEng-Cal-Dim-004:2020	P
	Height Gauge	(0.01 - 1000) mm	7 µm	EYEng-Cal-Dim-006:2021	P
	Depth micrometer, Depth Gauge	(0.01 - 650) mm	8 µm	EYEng-Cal-Dim-005:2021	P
	Ring Gauge	(1 to 50) mm	3 µm	EYEng-Cal-Dim-007:2021	P
		(> 50 to 225) mm	6 µm		
	Plug /pin gauges	(0.1 - 50) mm	1.5 µm		
	Setting rod Standards	(12 – 1250) mm	10 µm	EYEng-Cal-Dim-008:2021	P

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Dimensional	Tubular internal micrometer	(12 – 1250) mm	19 µm	EYEng-Cal-Dim-009:2021	P
	Bore / holtest micrometer	(1 – 225) mm	4 µm	EYEng-Cal-Dim-011:2021	P
	Feeler Gauges	(0.1 to 1) mm	14 µm	EYEng-Cal-Dim-010:2021	P
Force	Load cells Force measuring devices / machines Push and Pull gauge	Compression load		EYEng-CAL-For-001:2020	**P**
		4.44 N to 333 kN	0.1 %		
		Tension load			
		4.44 N to 267 kN	0.3 %		
	Cable Tensiometer	(6.78 to 1360) N	1.0 %	EYEng-Cal-Tor-001:2019	P
Torque	Torque wrench Torque Transducers Torque multiplier	(0.14 to 13.5) N.m	1.5 %	EYEng-Cal-Tor-001:2019	P
		(> 13.5 to 813) N.m	1.0 %		
		(> 813 to 2711) N.m	2.0 %		
	Torque tester	(0.1 to 3000) N.m	0.5 %		
Mass	Balance (Nonautomatic)	1 mg to 100 kg	1%	EYEng-Cal-Tor-002:2020	P/S
Vacuum Pressure	Pressure gauges, transducers, pressure switches	(-942 to 0) kPa	0.08 kPa	EYEng-Cal-Pre-001:2020	P/S
Pressure (Pneumatic)		0.1 kPa to 70 kPa	0.08 kPa		
		>70 kPa to 2 MPa	1.4 kPa		
		(>2 to 21) MPa	3.0 kPa		
		(>21 to 42) MPa	5.8 kPa		
Pressure (Hydraulic)		10 kPa to 35 MPa	5.8 kPa		
		(>35 to 140) MPa	18 kPa		
END					

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