

Specifications

The specifications are valid for instruments when the following conditions have been met:

- The instrument is being operated from a power source, which meets the line voltage and frequency specifications.
- The instrument has been operating for at least 20 minutes in an environment, which is within the operating environmental specifications.
- The instrument has been calibrated within the last 12 months. Calibration was performed in a controlled environment of $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$.

NOMINAL CHARACTERISTICS

Nominal characteristics describe parameters and attributes which are guaranteed by design, but do not have associated tolerances.

General

Input Configuration	True Differential, + and – Inputs Precision Voltage Generator can be selected as – input source in V_{COMP} mode.
Offset Capability	The Precision Voltage Generator can be used to provide true differential offset.
+Input Coupling Selections	AC, Off (Precharge), DC
–Input Coupling Selection	AC, Off (Precharge), DC, V_{COMP}
Input Connectors	BNC (+Input incorporates Probe Attenuation Coding sensing connector)
Maximum Input Voltage	Withstand up to $\pm 200\text{ Vp}$ continuous. Automatic input disconnect with manual reset.
Output Configuration	Single ended, Ground referenced
Output Impedance	$50\ \Omega$
Intended Output Load	$50\ \Omega$

DA1855A Differential Amplifier

Output Connector	BNC
Amplifier Gain	X1 or X10
Input Attenuation	$\div 1$ or $\div 10$
Bandwidth Limit Filters (Low Pass)	100 kHz, 1 MHz, 20 MHz or None (full bandwidth)
Bandwidth Limit Filter Characteristics	3-pole Bessel, 18 dB/octave
Auto Zero	Amplifier initiates an automatic balance cycle, when either gain button is depressed, to remove output offset drift
Effective Gain Indicator	Indicators show the effective system gain or attenuation, factoring Probe Attenuation, Attenuator and gain settings. (Probe must have coding connectors. $\div 1$, $\div 10$, $\div 100$ and $\div 1000$ probes are recognized)

Dynamic Ranges

Maximum Differential Mode Range

X10 Gain, $\div 1$ Attenuator	$\pm 50 \text{ mV}^1$
X1 Gain, $\div 1$ Attenuator	$\pm 0.5 \text{ V}^1$
X10 Gain, $\div 10$ Attenuator	$\pm 0.5 \text{ V}^1$
X1 Gain, $\div 10$ Attenuator	$\pm 5 \text{ V}^1$

Maximum Input Slew Rate

$\div 1$ Attenuator	$\pm 0.15 \text{ V}/\mu\text{sec}$
$\div 10$ Attenuator	$\pm 1.5 \text{ V}/\mu\text{sec}$

Maximum Common Mode Range

$\div 1$ Attenuator	$\pm 15.5 \text{ V}^1$
$\div 10$ Attenuator	$\pm 155 \text{ V}^1$

Differential Offset Range (V_{DIFF} mode referred to input)

X10 Gain, $\div 1$ Attenuator	$\pm 1 \text{ V}^1$
X1 Gain, $\div 1$ Attenuator	$\pm 10 \text{ V}^1$
X10 Gain, $\div 10$ Attenuator	$\pm 10 \text{ V}^1$
X1 Gain, $\div 10$ Attenuator	$\pm 100 \text{ V}^1$

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Comparison Offset Range (V_{COMP} mode, referred to input)

$\div 1$ Attenuator	$\pm 15.5 \text{ V}^1$
$\div 10$ Attenuator	$\pm 155 \text{ V}^1$

¹ Voltages are referred to the amplifier input connector. Multiply by probe attenuation factor to obtain value referred to probe input (e.g. $\pm 50 \text{ mV}$ becomes $\pm 0.5 \text{ V}$ at the probe tip when using a $\div 10$ probe.)

Precision Voltage Generator

Output Range	$\pm 15.5 \text{ V}$
Output Impedance	$\approx 10 \Omega$
Resolution	$100 \mu\text{V}$
Control	Individual increment and decrement digits carry over to the next decade
Reference Type	Oven stabilized buried zener diode
Output Routing	Can be applied to –Input and available at rear panel BNC connector

Power Requirements

Line Voltage Range	90 - 250 VAC
Line frequency Range	45 - 66 Hz

WARRANTED CHARACTERISTICS

Warranted characteristics describe parameters which have guaranteed performance. Unless otherwise noted, tests are provided in Section 8, Performance Verification, for all warranted specifications.

Gain Accuracy	$\pm 1\% +$ uncertainty of termination resistance
Bandwidth (-3 dB) x1 Gain	$> 100 \text{ MHz}$
Rise Time	$< 3.5 \text{ nsec}$ (Calculated from bandwidth)

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Common Mode Rejection, x1 or x10, $\div 1$ attenuation:	
70 Hz	$\geq 50,000:1$ (94 dB)
100 kHz	$\geq 50,000:1$ (94 dB)
10 MHz	$\geq 316:1$ (50 dB)
Precision Voltage Generator Accuracy(15° C to 45° C)	$\pm 0.05\%$ of reading + 500 μV

TYPICAL CHARACTERISTICS

Typical characteristics describe parameters, which do not have guaranteed performance. Tests for typical characteristics are not provided in the Performance Verification Procedure.

Input Resistance	
$\div 1$ Attenuator	1 M Ω or 100 M Ω 1 M Ω only when used with attenuating probe
$\div 10$ Attenuator	1 M Ω
Input Capacitance	20 pF
AC Input Coupling Capacitance	0.1 μF
$\div 10$ Attenuator Accuracy	0.05%
Bandwidth, x10 Gain	100 MHz
Common Mode Rejection Ratio	Refer to figure 9-1
Input Noise	Refer to figure 9-2 (With DXC100A probe, 100 Ω between tip and ground)
Overdrive recovery	In X10 gain, settles within 1 mV referred to input within 100 nsec from 4 V input (8000% overdrive)
Output Zero ¹	≤ 2 mV referred to input
Input Leakage Current	<10 pA (0° C to 45° C)
Differential Offset Accuracy	
X10 Gain, $\div 1$ Attenuator	0.1% + 50 μV^2
X1 Gain, $\div 1$ Attenuator	0.1% + 500 μV^2
X10 Gain, $\div 10$ Attenuator	0.15% + 500 μV^2
X1 Gain, $\div 10$ Attenuator	0.15% + 5 mV ²
Precision Voltage Generator Temperature Coefficient	<75 $\mu\text{V}/^\circ\text{C}$

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Power Consumption

DA1855A	≈ 28 W, ≈ 39 VA
DA1855A-PR2	≈ 56 W, ≈ 78 VA

¹Output Zero is the output voltage from zero with zero Volt applied between inputs. This specification is valid within 30 minutes from last Autozero cycle, and when the differential amplifier is operating in an environment with stable ambient temperature.

² Voltages are referred to the amplifier input connector. Multiply by probe attenuation factor to obtain value refer to probe input. (e.g. 0.1% + 50 μ V becomes 0.1% + 500 μ V at the probe tip when using a ± 10 probe.)

ENVIRONMENTAL CHARACTERISTICS

The Environmental Characteristics are tested to specification MIL-PRF-28800F Class 3. Refer to this specification if performance verification of environmental characteristics is required.

Temperature Range,

Operating	0° C to +50° C
Non-operating	-40° C to +75° C

PHYSICAL CHARACTERISTICS

Height

DA1855A	7.29 cm (2.87 inch)
DA1855A-PR2	8.75 cm (3.4 inch)

Width

DA1855A	21.2 cm (8.36 inch)
DA1855A-PR2	43.9 cm (17.3 inch)

(without rack mounting ears installed)

Depth

DA1855A	23.2 cm (9.12 inch)
DA1855A-PR2	42.5 cm (16.7 inch)

Weight

DA1855A	2.15 kg (4 lbs 12 oz.)
DA1855A-PR2	9.5 kg (21 lbs)

Shipping Weight

DA1855A	3.12 kg (6 lbs 14 oz.)
DA1855A-PR2	11.3 kg (25 lbs)

DA1855A Differential Amplifier

COMPLIANCES AND CERTIFICATIONS

CE Declaration of Conformity

The amplifier meets requirements of the EMC Directive 89/336/EEC for Electromagnetic Compatibility and Low Voltage Directive 73/23/EEC for Product safety.

EMC Directive:	EN 61326-1: 1998	EMC requirements for electrical equipment for measurement, control and laboratory use.
Electromagnetic Emissions:	EN 55011: 1998+A1:1999	Class A Conducted and Radiated Emissions
	EN 61000-3-2:2000	Harmonic Current Emissions
	EN 61000-3-3: 1995+A1:2002	Voltage Fluctuations and Flicker
Immunity:	EN 61000-4-2: 1995+A2:2001	Electrostatic Discharge
	EN 61000-4-3: 1996+A2:2001	RF Radiated Electromagnetic Field
	EN 61000-4-4: 1995+A2:2001	Electrical Fast Transient/Burst
	EN 61000-4-5: 1995+A1:2001	Surge
	EN 61000-4-6: 1996+A1:2001	RF Conducted Electromagnetic Field
	EN 61000-4-11: 1994+A1:2001	Mains Dips and Interruptions
Low Voltage Directive:	EN 61010-1: 1993+A2:1995	Safety requirements for electrical equipment for measurement control and laboratory use

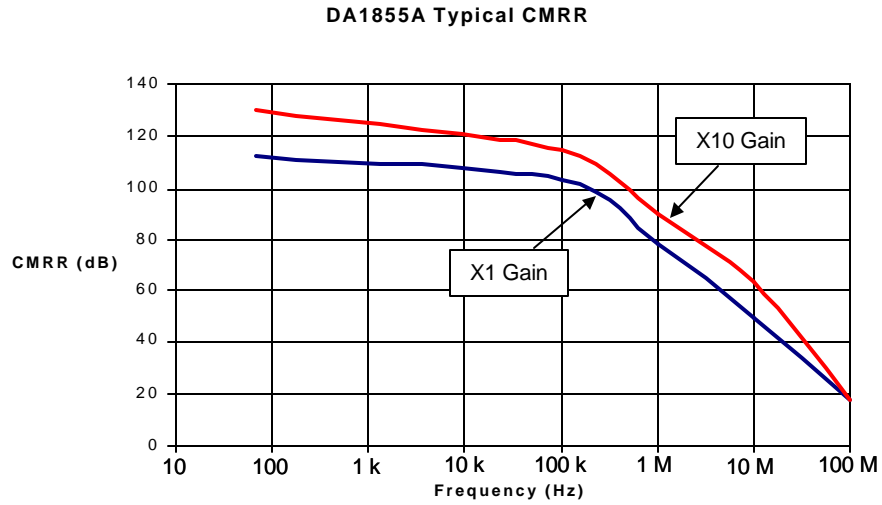


Figure 9-1. Typical CMRR

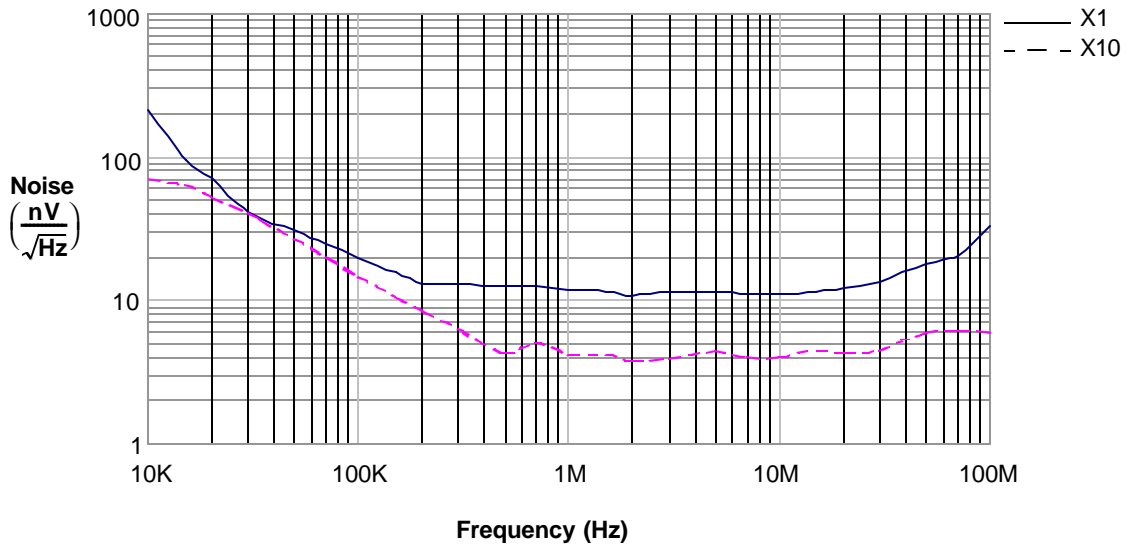


Figure 9-2. Noise Density (Referred to the input)

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