Specifications

Nominal, Typical, Supplement and Approximate values show the supplemental data of this product and these do not guarantee the performance.

Measured signal system

Input coupling	A, A-B: AC/DC switching AC coupling with two-stage cascaded 1st order HPF, HPF fc: 0.1Hz (nominal value) I: AC/DC switching, after converting the voltage C (LI5660 only) : DC (Always automatically cancel DC component) HF (LI5660 only): AC fc: 1 kHz (nominal value), when input impedance is 50 Ω, the AC-couple stage is positioned after the 50 Ω termination one.
Input ground	Float/Connect (to chassis) switching Withstand voltage : ± 1 Vpk max. (DC+AC) Impedance to chassis: 10 kΩ (float), 11 Ω (connected to the chassis)
Line filter	Through (disabled), fundamental wave rejection (50 Hz or 60 Hz), 2nd order harmonic rejection (100 Hz or 120 Hz), rejection of both fundamental and 2nd order harmonic Attenuation: 20 dB or more (at f_0) * When using the input C and HF, Line filter is disable regardless of Line filter settings.

• Voltage measurement

Input connector	**LI5660**	**LI5655**	**LI5650**	**LI5645**
	BNC (front panel A, B, C, HF)	BNC (front panel A, B)		
Input type	A, C, HF (single-end), A-B (differential)	A (single-end), A-B (differential)		
Frequency range	A, A-B, C: 0.5 Hz to 3 MHz HF: 10 kHz to 11 MHz	A, A-B: 0.5 Hz to 3 MHz	A, A-B: 1 mHz to 250 kHz	
Sensitivity	A, A-B: 10 nV to 1 V F. S. (1-2-5 sequence)			
	C: 1 mV to 10 V F. S. (1-2-5 sequence)	—		
	HF: 1 mV to 1 V F. S. (1-2-5 sequence)	—		

Voltage accuracy

	LI5660	**LI5655**
A, A-B	±0.5 % (1 kHz, signal level ≥ 1 mV, at 23 ±5°C)*1 ±2 % (1 kHz, signal level ≥ 1 μV)*1 ±0.5 % (≤ 20 kHz, sensitivity 100 mV to 1 V, at 23 ±5°C)*2 ±1 % (≤ 50 kHz, sensitivity 100 mV to 1 V)*2 ±2 % (≤ 100 kHz, sensitivity 100 mV to 1 V)*2 ±3 % (≤ 1 MHz, sensitivity 100 mV to 1 V)*2 ±5 % (≤ 3 MHz, sensitivity 100 mV to 1 V)*2 *1 at least 30 % full-scale signal (sensitivity), dynamic reserve LOW *2 DC coupling, dynamic reserve LOW and full-scale signal	
C	±0.5 % (≤ 20 kHz) ±1 % (≤ 50 kHz) ±2 % (≤ 100 kHz) ±3 % (≤ 1 MHz) ±5 % (≤ 3 MHz) 1 V to 10 V sensitivity, with full-scale signal, dynamic reserve LOW	—
HF	±3 % (≤ 1 MHz, input impedance 1 MΩ) ±5 % (≤ 3 MHz, input impedance 1 MΩ) ±7 % (≤ 10 MHz, input impedance 50 Ω) ±14 % (≤ 11 MHz, input impedance 50 Ω) Dynamic reserve LOW, sensitivity 100 mV to 1 V, full-scale signal	—

	LI5650 / LI5645
A, A-B	±0.5 % (1 kHz, signal level ≥ 1 mV, at 23 ±5°C)*1 ±2 % (1 kHz, signal level ≥ 1 μV)*1 ±0.5 % (≤ 20 kHz, sensitivity 100 mV to 1 V at 23 ±5°C)*2 ±1 % (≤ 50 kHz, sensitivity 100 mV to 1 V)*2 ±2 % (≤ 100 kHz, sensitivity 100 mV to 1 V)*2 ±3 % (≤ 250 kHz, sensitivity 100 mV to 1 V)*2 *1 at least 30 % full-scale signal (sensitivity), dynamic reserve LOW *2 DC coupling, dynamic reserve LOW and full-scale signal

Voltage accuracy temperature drift	
A, A-B	± 100 ppm / °C (supplementary value) 1 kHz, dynamic reserve LOW, A input, sensitivity 1 V, signal level 100% of F. S.

Input impedance

	LI5660	**LI5655 / LI5650 / LI5645**
A, B	10 MΩ (nominal value), 50 pF in parallel (supplementary value)	
C	1 MΩ (nominal value), 50 pF in parallel (supplementary value)	—
HF	1 MΩ (nominal value), 50 pF in parallel (supplementary value) | 50 Ω (nominal value)	—

Input referred noise	
A, A-B	4.5 nV/$\sqrt{\text{Hz}}$ (supplementary value) Dynamic reserve LOW, sensitivity 1 mV or less, 1 kHz, input short
Common-mode rejection ratio (CMRR)	
A-B	at least 100 dB AC coupling, 50 Hz to 1 kHz, signal source impedance 0 Ω, dynamic reserve LOW and sensitivity 20 mV or less (or MED and 2 mV or less)
Harmonic distortion	
A, A-B	−80 dBc or less (10 Hz to 5 kHz, 2-3rd order harmonics, each order) Dynamic reserve LOW, sensitivity 1 V, signal level 30% of F.S.

Maximum input voltage (linear operating range)

	LI5660	**LI5655 / LI5650 / LI5645**
A, B, A-B	± 3 V (Each terminal voltage and differential voltage at DC coupling) Dynamic reserve HIGH, sensitivity 1 V	
C	± 30 V Dynamic reserve HIGH, sensitivity 10 V	—
HF	± 3 V Dynamic reserve HIGH, sensitivity 1 V	—

Non-destructive maximum input voltage

	LI5660	**LI5655 / LI5650 / LI5645**
A, B	AC coupling: 10 Vrms (sine), DC±42 V DC coupling: ±14 V	
C	± 42 V	—
HF	± 5 V	—

• Current measurement (not equipped with LI5645)

Input connector	BNC (Front panel I)
Input type	Single-end
Frequency range	**LI5660** **LI5655** 0.5 Hz to maximum values shown in the table below (nominal values, 3 dB reduction frequency)

Cs Signal source capacitance + connected cable capacitance	Conversion gain	
	1 M (10^6) [V/A]	100 M (10^8) [V/A]
None	1 MHz	10 kHz
150 pF	1 MHz	10 kHz
1000 pF	150 kHz	1.5 kHz

LI5650

1 mHz to maximum values shown in the table below (nominal values, 3 dB reduction frequency)

Cs Signal source capacitance + connected cable capacitance	Conversion gain	
	1 M (10^6) [V/A]	100 M (10^8) [V/A]
None	250 kHz	10 kHz
150 pF	250 kHz	10 kHz
1000 pF	150 kHz	1.5 kHz

Current accuracy	±1% (nominal value) At 23 ±5°C, dynamic reserve LOW, sensitivity 1 μA (1 M V/A at 1 kHz) as well as sensitivity 10 nA (100 M V/A at 125 Hz), 30 % or more of full-scale sensitivity signal Both typical value.
Sensitivity	100 fA to 1μA full-scale (with 1M [V/A]) 10 fA to 10 nA full-scale (with 100 M [V/A]) Both 1-2-5 sequence
Current accuracy temperature drift	± 150 ppm / °C Dynamic reserve LOW, supplementary value for (1 M [V/A], 1 kHz) and (100 M [V/A], 125 Hz)
Input referred noise	150 fA/$\sqrt{\text{Hz}}$ (1M [V/A], 1kHz) 15 fA/$\sqrt{\text{Hz}}$ (100M [V/A], 125Hz) Both supplementary value
Input impedance	1 kΩ (1M [V/A]) 100 kΩ (100M [V/A]) Both supplementary value
Maximum input current (linear operating range)	±3 μA DC coupling, dynamic reserve HIGH, conversion gain 1 M [V/A] sensitivity 1 μA

• Noise density measurement

Sensitivity	**LI5660 / LI5655 / LI5650** Voltage: 20 nV/$\sqrt{\text{Hz}}$ to 1 V/$\sqrt{\text{Hz}}$ (A, A-B) 1 mV/$\sqrt{\text{Hz}}$ to 10 V/$\sqrt{\text{Hz}}$ (C*) 1 mV/$\sqrt{\text{Hz}}$ to 1 V/$\sqrt{\text{Hz}}$ (HF*) Current: 1 pA/$\sqrt{\text{Hz}}$ to 1 μA/$\sqrt{\text{Hz}}$ (with 1 M [V/A]) 100 fA/$\sqrt{\text{Hz}}$ to 10 nA/$\sqrt{\text{Hz}}$ (with 100 M [V/A]) All in 1-2-5 sequence * LI5660 only **LI5645** Voltage: 20 nV/$\sqrt{\text{Hz}}$ to 1 V/$\sqrt{\text{Hz}}$ (1-2-5 sequence)

Phase sensitive detector section

Phase sensitive detector (PSD)	**LI5660 / LI5655 / LI5650** 2 phase (Rcos θ, Rsin θ), Dual PSD (primary PSD secondary PSD). **LI5645** 2 phase (Rcos θ, Rsin θ), 1 PSD (primary PSD).
PSD settings items	Sensitivity, time constant, phase, XY offset, dynamic reserve
Detection mode	

Detection mode	Measurement frequency	
	Primary PSD	Secondary PSD*1
SINGLE*2	Fundamental/ Fraction Harmonic	None
DUAL1*1 *3	Fundamental/ Fraction Harmonic	Fundamental/ Harmonic
DUAL2*1 *4	Primary frequency	Secondary frequency
CASCADE*1 *5	Primary frequency	Secondary frequency

*1 Not equipped with LI5645
*2 2-phase detection is at one frequency.
*3 The fundamental and a harmonic component of one input signal are measured simultaneously.
*4 Two independent frequency components (primary and secondary) of one input signal are measured simultaneously.
*5 The secondary PSD is connected in cascade with the primary PSD, so after a signal is detected by the primary PSD, it is further detected by the secondary PSD.

Dynamic reserve	At least 100 dB (supplementary value) LOW/MEDIUM/HIGH 3-point switching (common in primary PSD and secondary PSD)
Time constant filter	**LI5660 / LI5655** Time constant: 1 μs to 50 ks (1-2-5 sequence) Attenuation slope: 6, 12, 18. 24 dB/oct **LI5650 / LI5645** Time constant: 5 μs to 50 ks (1-2-5 sequence) Attenuation slope: 6, 12, 18. 24 dB/oct

Synchronous filter	On/Off
Phase noise	**LI5660 / LI5655**
	0.001° rms (at 1 kHz, attenuation slope : 18 dB/oct or more) 0.003° rms(at 100 kHz, attenuation slope : 12 dB/oct or more) 0.01° rms (at 3 MHz, attenuation slope : 12 dB/oct or more) Supplementary value; reference signal is external sine wave 1 Vrms, time constant 100 ms, synchronization filter off
	LI5650 / LI5645
	0.001° rms (at 1 kHz, attenuation slope : 18 dB/oct or more) 0.003° rms(at 100 kHz, attenuation slope : 12 dB/oct or more) 0.01° rms (at 250 kHz, attenuation slope : 12 dB/oct or more) Supplementary value; reference signal is external sine wave 1 Vrms, time constant 100 ms, synchronization filter off
Phase temperature drift	**LI5660 / LI5655**
	± 0.01°/ °C (100 Hz ≤ frequency ≤ 10 kHz) ± 0.03°/ °C (10 kHz < frequency ≤ 100 kHz) ± 0.2°/ °C (100 kHz < frequency ≤ 3 MHz) Supplementary value when input signal (A connector) and external reference signal (REF IN connector) are both Sine wave 1Vrms.
	LI5650 / LI5645
	± 0.01°/ °C (100 Hz ≤ frequency ≤ 10 kHz) ± 0.03°/ °C (10 kHz < frequency ≤ 100 kHz) ± 0.2°/ °C (100 kHz < frequency ≤ 250 kHz) Supplementary value when input signal (A connector) and external reference signal (REF IN connector) are both Sine wave 1Vrms.

Reference signal system

Reference signal source	• REF IN: the external reference signal is used as the primary PSD's reference frequency at SINGLE, DUAL1*, and DUAL2*, and is used as the secondary one at CASCADE* • INT OSC: internal oscillator • SIGNAL: measurement signal (cannot be used when input HF is selected) * Except for LI5645

• External reference signal

Waveform	SIN POS, TTL POS, TTL NEG
Input connector	BNC (Front panel REF IN)
Input impedance	1 MΩ (nominal value), 100 pF in parallel (supplementary value)
Input voltage range	SIN: 0.3 to 20 Vp-p (sine), TTL: 0 to 5 V, High 2.6 V or more, Low 0.8 V or less (square)
Pulse width (square wave)	40 ns or more (both High level and Low level)
Non-destructive maximum input voltage	±15 V
Synchronization frequency range	**LI5660**

Signal input	Detection mode	External reference signal	Synchronization frequency range
A A-B C I	SINGLE DUAL1 DUAL2 CASCADE	SIN POS TTL POS TTL NEG	0.3 Hz to 3.2 MHz
HF	SINGLE DUAL1 DUAL2	TTL POS TTL NEG	8 kHz to 11.5 MHz
	CASCADE	SIN POS TTL POS TTL NEG	0.3 Hz to 3.2 MHz

LI5655

Signal input	Detection mode	External reference signal	Synchronization frequency range
A A-B I	SINGLE DUAL1 DUAL2 CASCADE	SIN POS TTL POS TTL NEG	0.3 Hz to 3.2 MHz

LI5650

Signal input	Detection mode	External reference signal	Synchronization frequency range
A A-B I	SINGLE DUAL1 DUAL2 CASCADE	SIN POS	0.3 Hz to 260 kHz
		TTL POS TTL NEG	0.5 mHz to 260 kHz

LI5645

Signal input	Detection mode	External reference signal	Synchronization frequency range
A A-B	SINGLE	SIN POS	0.3 Hz to 260 kHz
		TTL POS TTL NEG	0.5 mHz to 260 kHz

Synchronization time	2 periods + 50 ms (supplementary value)
Frequency display resolution	6 digits (0.1 mHz at less than 100 Hz)
Frequency measure-ment accuracy	± (40 ppm + 1 count)

• Internal Oscillator

Frequency (primary and secondary)	Oscillates two independent frequencies (primary frequency and secondary frequency) (detection mode DUAL2*1, CASCADE*1) • Setting range: LI5660 / LI5655 0.3 Hz to 3.2 MHz (A, A-B, C*2,I) 8 kHz to 11.5 MHz (HF*2) LI5650 / LI5645 0.5 mHz to 260 kHz • Resolution: 6 digits (0.1 m Hz, less than 100 Hz) • Accuracy: ± 40 ppm *1 Except for LI5645 *2 LI5660 only
Reference frequency source	Internal / external switching

Reference frequency source	
Frequency range	10 MHz ± 0.2 %
Waveform	Sine Wave or Square Wave (duty 45 to 55%)
Signal level	0.5 Vp-p to 5 Vp-p
Non-destructive maximum input voltage	10 Vp-p
Input impedance	1 kΩ (nominal value)
Input coupling	AC
Withstand voltage	± 42 Vpk max. (DC+AC) (Allowable voltage to ground)
Sine wave output	
Frequency	Primary frequency (with detection mode SINGLE, DUAL1*) Primary frequency/secondary* frequency (With detection mode DUAL2*, CASCADE*, selectable) * Except for LI5645
Amplitude	0 to 10.00 mVrms / 0 to 100.0 mVrms / 0 to 1.000 Vrms When > 3.2 MHz, 0 Vrms regardless of the setting (LI5660/LI5655 only)
Amplitude accuracy	**LI5660 / LI5655**: ±(2% of setting + 1 mV) ≤ 20 kHz; ±(3% of setting + 1 mV) ≤ 100 kHz; ±(4% of setting + 2 mV) ≤ 1 MHz; ±(7% of setting + 5 mV) ≤ 3.2 MHz **LI5650 / LI5645**: ±(2% of setting + 1 mV) ≤ 20 kHz; ±(3% of setting + 1 mV) ≤ 100 kHz; ±(4% of setting + 2 mV) ≤ 260 kHz
Maximum output current	± 15 mA
Output impedance	50 Ω (nominal value)
Harmonic distortion (Output voltage setting 1 Vrms, supplementary value)	**LI5660 / LI5655** -80 dBc or less (20 Hz ≤ frequency ≤ 5 kHz, no load, 2nd to 5th order) -70 dBc or less (5 kHz < frequency ≤ 100 kHz, no load, 2nd to 5th order) -60 dBc or less (100 kHz < frequency ≤ 1 MHz, 50 Ω, 2nd to 3rd order) -50 dBc or less (1 MHz < frequency ≤ 3 MHz, 50 Ω, 2nd to 3rd order)
	LI5650 / LI5645 -80 dBc or less (20 Hz ≤ frequency ≤ 5 kHz, no load, 2nd to 5th order) -70 dBc or less (5 kHz < frequency ≤ 100 kHz, no load, 2nd to 5th order) -60 dBc or less (100 kHz < frequency ≤ 250 kHz, 50 Ω, 2nd to 3rd order)
Square wave output	
Frequency	Primary frequency (with detection mode SINGLE, DUAL1*) Primary frequency/secondary frequency (With detection mode DUAL2*, CASCADE*, selectable) * Except for LI5645
Signal level	TTL (0 to 3.3 V, nominal value at no load), ±8 mA max. (supplementary value) Less than 3.2 MHz, Output level fixed in High or Low (LI5660/LI5655 only)
Harmonic measurement	
Detection mode SINGLE	The primary frequency to the PSD is n/m times of reference signal frequency n range (harmonic) 1 to 63 m range (sub harmonic) 1 to 63
Detection mode DUAL1 (Except for LI5645)	The primary frequency to the primary PSD is n/m times of the reference signal frequency. The secondary frequency to the secondary PSD is n times of the reference signal frequency. n PRI range (harmonics number of primary PSD) 1 to 63 m PRI range (sub harmonics number of primary PSD) 1 to 63 n SEC range (harmonics number of secondary PSD) 1 to 63

Allowable frequency range of Harmonic measurement

Reference signal source	Fundamental frequency range	Harmonic frequency range
REF IN	Synchronization frequency range to external reference signal	Same as at left
INT OSC	Internal oscillator frequency setting range	Same as at left
SIGNAL	Synchronization frequency to external reference signal	Regardless of n, m settings, always operates at n = 1 and m = 1

Phase adjustment range	−180.000° to +179.999° (resolution 0.001°)
Orthogonality	± 0.001° or better (supplementary value)
Phase accuracy	**LI5660 / LI5655**: ±1° (DC coupling, ≤ 10 kHz); ±2° (DC coupling, ≤ 100 kHz); ±5° (DC coupling, ≤ 1 MHz); ±10° (DC coupling, ≤ 3 MHz) **LI5650 / LI5645**: ±1° (DC coupling, ≤ 10 kHz); ±2° (DC coupling, ≤ 100 kHz); ±5° (DC coupling, ≤ 250 kHz) Supplementary value; at Sine wave 1 Vms, both A input (sensitivity 1 V) and external reference signal input

Arithmetic processing

Offset adjustment	X, Y: sensitivity of ± 105% (resolution 0.001%) Both of primary PSD and secondary PSD* can be set * Except for LI5645
EXPAND	X, R:1, 10, 100 (Ratio of X and R is common) Y:1, 10, 100 • Primary PSD and secondary PSD* can be set individual • Apparent sensitivity (signal full-scale) is 1 / EXPAND magnification • Unusable when normalize or ratio calculation is running. * Except for LI5645
Normalize (normalize calculation not available or select from right)	% value = (measured value / standard value) x 100 dB value = 20 × $\log_{10}$ | Measurement values / standard values | % FS value = (measured value / sensitivity) × 100 • When detection mode is SINGLE, DUAL1*, DUAL2*, the above measurement value = primary PSD output (X or R) • When detection mode is CASCADE*, the above measurement value = secondary PSD output (X or R) Standard value range: voltage 1 nV to 10 V, current 1 fA to 1 μA*, resolution 6-digit • Unusable when EXPAND or Ratio calculation is running. * Except for LI5645

Ratio	Ratio of measured value A and standard value B ratio = K × A ÷ B K: 0.1 to 10 (resolution 0.00001) A, B: Select from a combination of the below

A (measured value)	B (standard value)	Detection mode
Primary PSD output (X, Y, R) / Sensitivity	AUX IN 1 Measurement value / 10 V	SINGLE
Primary PSD output (X, Y, R) / Sensitivity	Secondary PSD X output / Sensitivity	DUAL1* DUAL2*
Secondary PSD output (X, Y, R) / Sensitivity	AUX IN 1 Measurement value / 10 V	CASCADE*

* Maximum update rate of B is 10 k sample/s * Except for LI5645
• When executing expansion or normalizing or ratio arithmetic processing it cannot be performed.

Measured value output and display

Parameter

Output/ Display	Detection mode	
	SINGLE	DUAL1*, DUAL2*, CASCADE*
DATA1	X, R, AUX IN 1, NOISE	Xp, Rp, Yp, θp, Xs, Rs, AUX IN 1, NOISE
DATA2	Y, θ, AUX IN 1, AUX IN 2	Yp, θp, Xs, Rs, Ys, θs, AUX IN 1, AUX IN 2
DATA3	X, R	Xp, Rp, Yp, θp, Xs, Rs
DATA4	Y, θ	Yp, θp, Xs, Rs, Ys, θs
Remarks X, Y, R, θ suffix	n: harmonic (At harmonic value settings, n as a suffix. Ex.: Xn)	p: primary ditector s: secondary ditector n: harmonic (At harmonic value settings, n as a suffix. Ex.: Xpn)

* Except for LI5645

Analog output

Full scale voltage	± 10 V (bipolar signal) , +10 V (unipolar signal)
Output voltage range	± 12 V (no-load)
Maximum output current	± 10 mA
Output impedance	470 Ω (nominal value)
Output voltage accuracy	± (0.3% + 10 mV) to measurement value
Maximum update rate	**LI5660 / LI5655**
	DATA OUT 1/DATA OUT2 (Front panel) 312.5 k sample/s. DATA OUT 3/DATA OUT4 (Rear panel) 1.5625 M sample/s.
	LI5650 / LI5645
	DATA OUT 1/DATA OUT2 (Front panel) 156.25 k sample/s. DATA OUT 3/DATA OUT4 (Rear panel) 781.25 k sample/s.
Measurement screen display	Normal: show the measured values (DATA1, DATA2) and key settings Large: enlarged display the measured values (DATA1, DATA2) Fine: Show the measured values (DATA1, DATA2, DATA3, DATA4) and advanced settings On Normal and Large measurement screens, displays measured values as bar graphs as well as numerical values.

Numeric display

Parameter	Numeric display		Measurement value for the full scale voltage of the analog output
	Range	Resolution	
X, Y	Sensitivity / EXPAND (±120%)	6 digits, at full-scale sensitivity	± sensitivity / EXPAND ratio
R	Sensitivity / EXPAND (0 to 120%)	6 digits, at full-scale sensitivity	Sensitivity / EXPAND ratio
θ	-180.000 to +179.999 °	0.001 °	± 180 °
NOISES (Noise density)	Sensitivity 0 to 120 %	6 digits, at sensitivity F. S.	Sensitivity
AUX IN 1, 2	± 12 V	0.001 V	± 10 V
Ratio	± 2.4	0.00001	± 2
Normalize %	± 240 %	0.001 %	± 200 %
Normalize % of full-scale	± 120 % of F.S.	0.001 % of F.S.	± 100 % of F.S.
Normalize dB	± 120 dB	0.001 dB	± 100 dB

Monitor output

Monitor signal	Phase sensitive detector input signal
Maximum output	Maximum output voltage ± 3 V (no-load), maximum output current ± 20 mA
Output impedance	50 Ω (nominal value)

Automatic setting items

Measurement	Perform the following items “time constant”, “sensitivity”, “phase”
Time constant	Set the time constant and attenuation slope corresponding to the frequency of the reference signal.
Sensitivity	Set the sensitivity , and dynamic reserve according to the input signal.
Phase	Set the phase shift value as Y and phase output to a zero
Offset	Set each offset value, X and Y outputs to a zero

Auxiliary input (DC voltage measurement)

Number of channels	2
Maximum allowable input voltage	(linear operating range) ± 12 V
Non-destructive maximum input voltage	± 42 V
Input impedance	1 MΩ (nominal value), 50 pF in parallel (supplementary value)
Voltage measurement accuracy	± (0.3% + 10 mV), when the input ground is equal to the chassis potential
Frequency bandwidth	Highest: 5 kHz (-3 dB) (supplementary value)
Sampling rate	Highest: 125 k sample / s
Floating characteristics	Signal Ground Maximum voltage to ground (non-destructive): ± 42 Vpk max. (DC+AC) Ground impedance: 1 MΩ (nominal value) Signal Maximum voltage to ground: ± 42 Vpk max. (DC+AC)

Auxiliary output (DC voltage output)

Number of channels	2
Output voltage range	± 10.500 V (resolution 0.001 V)
Maximum output current	± 5 mA
Output impedance	1 kΩ (nominal value)
Output voltage accuracy	± (0.3% + 10 mV), at no load

Data Memory

Record data	For each sample data, select arbitrary up to five words from the recorded data
Recording capacity	Buffer 1, 2: 16 to 8192 sample Buffer 3: 16 to 65536 sample (FIFO)
Trigger Signal	Internal timer/External trigger/Remote control commands/Manual trigger 1 sample recorded when trigger signal is received
Sampling interval	**LI5660 / LI5655**
	Internal timer Range: 1.92 µs to 20 s, repeated at equal intervals, resolution: 640 ns, 6 digits max. External trigger/Remote control commands/Manual trigger Range: ≥ 2.6 µs arbitrary intervals, trigger jitter 640 ns (nominal value)
	LI5650 / LI5645
	Internal timer Range: 9.6 µs to 20 s, repeated at equal intervals, resolution: 640 ns, 6 digits max. External trigger/Remote control commands/Manual trigger Range: ≥ 2.6 µs arbitrary intervals, trigger jitter 640 ns (nominal value)
External trigger	Signal level: TTL (0 to 5 V, High 2.6 V or more, Low 0.8 V or less), Minimum pulse width: 500 ns (both high and low level) Effective edge: Falling, input impedance: 10 kΩ (nominal value) Non-destructive maximum input voltage: ± 15 V
Trigger delay time	0 to 100 s (resolution: 640 ns, 6 digits max.)

Remote control interface

USB	USBTMC, USB 2.0 High speed
RS-232	4800 / 9600 / 19200 / 38400 / 57600 / 115200 / 230400 bps
GPIB	Compliance standards IEEE 488.1, IEEE 488.2
LAN	10BASE-T / 100BASE-TX, TCP/IP

General specification

Display	4.3-inch WQVGA, color LCD
Power supply	AC 100 V ± 10% / 120 V ± 10% / 230 V+10%, - 14% However 250 V or less 50 Hz / 60 Hz ± 2 Hz, power consumption 75 VA or less, over voltage category II
Operating temperature / humidity range	0 to +40°C 5 to 85% RH, absolute humidity 1 to 25 g / m^3, no condensation
Warm-up time	30 minutes
Setting memory	9 sets
Resume	Return to the last settings at power-on state
Power output for Preamp	± 15 V (nominal value) 100 mA max. (rear panel PREAMP POWER)
External dimensions (mm)	430 (W) × 88 (H) × 400 (D) Excluding protrusions
Weight	Approx. 7.5 kg Except for accessories

Accessories and options

Accessories	Instruction manual, CD-ROM (remote control driver etc.) power cord set (3-pin, 2 m) fuse (time lag, 1.0 A / 250 V, φ 5.2 × 20 mm), protective cap* (for current input terminal) * Except for LI5645
Option	PA-001-2779 EIA rack-mount kit PA-001-2780 JIS rack-mount kit

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