

Magnetostrictive Position Sensors



L Series (Model LH) to G-Series Linear-Position Sensor

Cross Reference





Replacement and retrofit options for the L-Series Model LH sensor G-Series model number descriptors (Model LH retrofit options) L-Series model LH number descriptors Sensor model Sensor model A Flange type A Flange type **B** Stroke range B Connection type **C** Integral cable length C Connection type D Stroke length D Input voltage E Input voltage ► E Output E Output type (Note 2) Н Т D 6 0 0 U # # # # 1 V 0 Н L G Т # # # # U D 6 0 1 V # (C) S Μ S # # # 2 # Μ # # Α 0 S # # # # Μ R В # 2 Α # (C) Μ R В 1 Α Μ F Μ # 0 (#) R Ν R G 2 A В R Ν (#) # # 0 В R 3 0 A F # # D L # 0 R 1 R D Ε # R 2 Ν 0 2 5 6 7 8 9 10 11 12 13 14 15 1 3 4 R 3 D L # # Μ Ε # R D # Notes: Н 0 1. Many of the G-Series "backwards compatible" options as shown above are not included in other G-Series literature. 4 9 10 11 12 13 14 15 16 17 1 2 3 5 6 7 8 2. The characters (C) and (#) in parenthesis, as shown above, indicate model number characters that are not usually needed, and are used only for certain options.

Contact MTS Applications Engineering for any model LH options that are not cross referenced in this document.



All specifications are subject to change. Please contact MTS for specifications that are critical to your needs. Go to http://www.mtssensors.com/prodspec.htm for the latest list of G-Series support documentation.

G	A-Series Cross Reference																												
Α	Flange	e Ty	pe (and	hydra	ulic ap	plicatio	on hou	sing)																				
LH	nodel	nur	nbe	r exa	mple	:									G-Se	ries	equiva	lent	mode	l num	ber (exam	ple:						
L	H	Τ													G	H	Τ												
1	2	3	4	5	6	78	3 9	10 1	1 12	13	3 14	15	16	17	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LHI	/lodel	GH	1		Desc	ription																							
	ŗ	Т						t. threa					(
	S VI	S M						st. threa thread	,																				
	N 3	No B	ot av	vailab	le	I	Metric	thread	s, raise	ed-fa	aced	hex		olicatior	houo	ing)													
	Conn	-	on T	ivno			5611501	Cartin	ige on	iy (i	IO IIY	uraun	ic app	JIICaliOI	nous	iiiy)													
	nodel				mple	:									G-Se	ries	equiva	lent i	nodel	numl	ber e	exam	ole:						
L	н	Т	R	0	0	5				Г	Т	1			G	Н							R	0	5				
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														in L-Ser															
Wir	ng/Co	nne	ctio	ns se	ection	of the	G-Seri	es Use						ontrollei : wiring															
note	s for t	the (coni	necti	on op	otion ch	osen b	elow.																					
LH					optio							<i></i>																	
D6						<u>integra</u> "D60"								H mode	l has t	<u>the s</u>	<u>ame o</u>	ption	avail	<u>able:</u>									
		Va		IIba		intogra		-		. т	o votu		he C	llmada	l haa '	0	tiono o		hlar										
RB		1.	Sele	ect o	ption	"D60"	for inte	egral 6	-pin Dl	IN m	nale c	onne	ctor, .	<u>H mode</u> AND rej	place y	/our	compl	ete e	xtens										
						ole conr age 4.	nector	with th	e field	-inst	talled	in-lir	1e 6-p	pin DIN	femal	e coi	nnecto	r, pai	t no.	37042	23, s	older	ing re	equire	d, (s	old se	epara	ely).	See
		2.	Sele	ect o	ption	"D60"								AND us			ter cab	ole pa	art no	2532	243-2	x or 2	5324	4-x, (sold	separ	ately	. Se	е
		3.												under T connect			"RB1"	for	1 foot	integ	ral c	able	length	n, (sta	ndar	d), or	"RB	2" for	r 5
														Note 2						0			0			,,			
RG														H mode															
														AND rep pin DIN															See
			Tab	le C	on pa	age 4.																	-	-			-	- /	
		Ζ.												AND us Inder Ta					ITL TIU	niber	2034	240-1	(110	01) 01	253	240-4	2 (5 1	el),	
MS		Yo	ur I	H ha	as an	integra	l 10-ni	n MS r	nale co	onne	ector	To r	etrofi	it, the G	H moo	del h	as 3 oi	otion	s avai	lable:									
		1.	Sele	ect o	ption	"D60"	for inte	egral 6	-pin Dl	IN m	nale c	onne	ctor,	AND re	place y	/our	compl	ete e	xtens	ion ca	ble								
						ole conr on page		with th	e field	-INS	talled	in-lir	1e 6-p	pin DIN	female	e coi	nnecto	r par	t num	iber 5	6070	JU, SC	lderii	ng req	uirec	1, (SO	ld sei	arate	iy)
														AND us under T					art no	2532	245-2	x, or a	25324	16-x, ((sold	sepa	rately). See	е
			Sele	ect o	ption	"FM#"	for int	egral c	able (p	oolyı	uretha	ane ja	icket)	with th	e in-li	ne N	IS mal	é cor								gral c	able I	ength	١,
			(sta	Indar	'd), (or "FM2	" for 5	-foot ii	ntegral	cab	ole ler	ngth.	(For	reverse	acting) out	puts, s	ee N	ote 2	undei	r Tab	ole D	on pa	ge 5.)					
R0														the GH							01 1	- 00	<u>ет у ле</u>			4 :			
														encode # Iser's M										or rev	erse	-actin	g oui	puts,	
R1 (nr R2	Yo	ur I	H ha	as an	integra	l cable	and ar	ı in-lin	e 6-	nin M	/IS m	ale co	onnecto	r Tor	retro	fit the	GH	nodel	has	2 on	tions	availa	ihle.					
		1.	See	Tab	le F o	n page	5 or c	ontact	MTS A	\ppli	catio	ns En	ginee	ering to	see if	you	can co	nneo	t the	GH m	odel	sens	or di	rectly					
														utput Motion "D															t no.
			253	302-	-1 (fo	r R1) o	r 2533	02-2 (1	for R2)), (s	old se	epara	tely).				-												
														370015													able li	ingun),
R3		Y٥	ur I	H ha	is an	integra	l cahle	and ar	n in-lin	e 10)-nin	MS n	nale c	connect	or. To	retr	ofit th	e GH	mod	el has	3 ი	ntion	s avai	lable:					
		1.	Sele	ect o	ption	"D60"	for inte	egral 6	-pin Dl	IN m	nale c	onne	ctor,	AND re	place y	/our	compl	ete e	xtens	ion ca	ble	(sold	sepai	ately)		0505	40.5	/F	
		2.				"D60" I separa		egral 6	-pin Di	IN M	nale c	onne	ctor,	AND us	e the a	adap	ter cab	ole pa	irt no	2532	45-	3, (1	root l	ength), Or	2532	46-3,	(5 10	OT
			Sele	ect o	òtion	"R##"	for inte							on, (enc				leng	th) AN	ID ins	tall a	an in-	line 1	0-pin	MS	male	conn	ector,	,
														e Table I					,									,	

	s nei																										
C Integral cable	length																										
LH model number	example	:										G-Series equivalent model number example:															
LHTR	0 0	5										G	H	T		Γ	Τ				R	0	5				
1 2 3 4	56	7	8 9	10	11	12	13	14	15	16	17	1	2	3	4	5	;	6	7	8	9	10	_	12	13	14	15
LH Model	GH			I	Desci	riptio	on																				
01 to 99 ft.		o 99 ft			Cable																						
01 to 30 meters	01 t	o 30 m	neters		Cable	e ien	gtn in	n me	ters																		
Note:																											
Encode length in t	feet if us	sing US	S custo	mary	strok	e ler	ngth,	in m	neter	s if us	sing m	netric s	troke	e leng	th.												
D Stroke length																											
LH model number	example	:										G-Se	ries e	equiva	lent	mod	lel n	umbe	er e:	xamp	le:						
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1 2 3 4	56		89	10			13	14	15	16	17	1	2	3	4	5			7	8	9	10	11	12	13	14	15
	cu				Decer	uinti.																					
<u>LH</u> U	GH		U		Desci Strok	-		in in	ches	and	enths	, 2 to 3	100 ii	n (Fn	code	in () 1 ir	inc	rem	nents)						
M			— Ŭ									7620)						
E Input voltage																											
LH model number	example	:										G-Se	ries (equiva	alent	moc	del n	umbe	er e	xamp	ole:						
LHTR	0 0	5	U 0	1	2	0	1					G	Н	Τ	0	1	1	2	0	U	R	0	5	$\frac{1}{2}$			
1 2 3 4	56	7	89	10	11	12	13	14	15	16	17	1	2	3	4	5		6	7	8	9	10	11	12	13	14	15
Notes:																											
	to the l	Serie	s the ii	nput v	oltag	e op	tions	: "1"	and	"2" h	ave ba	asically	' swa	ipped	value	es fo	or the	e G-S	Serie	es. (The	G-Ser	ies fo	llows	the o	conve	en-
1. Compared tion estab	lished b	y the E	-Series	sand	R-Sei	ries	senso	ors.)				-															
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 Compared tion estab For the ab 	lished b ove exa	y the E mple, v	E-Series when re	s and etrofit	R-Sei ting L	ries _H se	senso ensor	ors.) rs wi	th si	troke	length	-															
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Tables

Table A									
Wire color code for RB	style extension cable	Replace RB connector on ex	Replace RB connector on extension cable by Installing 6-pin DIN female connector, part no. 370423						
RB pin no.	Wire colors	Pin-out for Analog output	Pin-out for Digital-Pulse output	Pin-out for Neuter output only					
1	White	6	6	6					
2	Brown	No Connection	No Connection	No Connection					
3	Gray	2	1	1 (Note 1)					
4	Pink	1	2	No Connection					
5	Red	5	5	5					
6	Blue	No Connection	No Connection	No Connection					
7	Black	3 (Note 2)	No Connection	No Connection (Note 3)					
8	Violet	4 (Note 2)	No Connection	2					
9	Yellow	No Connection	3	3 (Notes 4, 5)					
10	Green	No Connection	4	4 (Notes 4,5)					

Notes:

The G-Series output signal, "(-) Stop", is not used when providing the backwards –compatible neuter type connection. However, this signal wire / connector pin is used for "RS-422 TX-" during serial programming of the sensor. When the sensor output is active, (not in programming mode), this signal must be left unconnected to allow the proper neuter type output.

2. If the G-Series sensor is replacing a L-Series sensor where the reverse-acting output, 10 to 0 Vdc, is being used, then the wire connections must be changed at the controller. The black wire (RB pin 7) will now be used for "Programming (RS-485+)" by the G-Series sensor instead of the 10 to 0 Vdc reverse-acting output. Also, the violet wire (RB pin 8) will now be used for "Programming (RS-485-)" by the G-Series sensor instead of the return connection for the reverse-acting output. The input connections at the controller will now need to use the pink wire (RB pin 4) for the 10 to 0 Vdc sensor signal, and the gray wire (RB pin 3) for the output return connection.

 If the black wire (RB pin 7) was originally used as DC ground for the L-Series sensor being replaced then the DC ground connection at the controller must be changed to use the white wire (RB pin 1).

- 4. When connecting to an Analog Output Module (AOM), or to a Digital Interface Box (DIB), or to a custom interface/controller that requires singleended interrogation, always connect the unused interrogation lead, "(+) Start" or "(-) Start" to ground at the AOM / DIB / controller.
- 5. For improved noise rejection and stable operation when using external interrogation use the positive and negative interrogation signals, "(+) Start" and "(-) Start", to provide differential inputs to the sensor.

Table B

Female straight exit D6 to male RB connection adapter cables	
1 ft. cable length, standard, for G-Series analog output sensors	Part no. 253243-1
1 ft. cable length, standard, for G-Series digital-pulse and neuter output sensors	Part no. 253243-2
5 ft. cable length, for G-Series analog output sensors	Part no. 253244-1
5 ft. cable length, for G-Series digital-pulse and neuter output sensors	Part no. 253244-2

Note:

For reverse-acting outputs, see Note 2 under Table A.

Table C

Wire color code	for RG style extension cable	Replace RG connector on extension cable by installing 6-pin DIN female connector, part no. 5607				
RG pin no.	Color	Pin-out for Analog outputs and for Digital-pulse outputs				
1	Gray	1				
2	Pink	2				
3	Yellow	3 (Note 1, 2, 3)				
4	Green	4 (Note 1, 2, 3)				
5	Red or Brown	5				
6	White	6				
7	No connection	No connection				

Notes:

1. If the G-Series sensor is replacing a L-Series sensor where the reverse-acting output, 10 to 0 Vdc, 20 to 4 mA or 20 to 0 mA, is being used, then the wire connections must be changed at the controller. The yellow wire (RG pin 3) will now be used for "Programming (RS-485+)" by the G-Series sensor instead of the reverse-acting output. Also, the green wire (RG pin 4) will now be used for "Programming (RS-485-)" by the G-Series sensor instead of the return connection for the reverse-acting output. The input connections at the controller will now need to use the gray wire (RG pin 1) for the 10 to 0 Vdc, 20 to 4 mA or 20 to 0 mA sensor signal, and the pink wire (RG pin 2) for the output return connection.

2. When connecting to an interface/controller that requires single-ended interrogation, always connect the unused interrogation lead, "(+) Start" or "(-) Start" to ground at the controller.

3. For improved noise rejection and stable operation when using external interrogation use the positive and negative interrogation signals, "(+) Start" and "(-) Start", to provide differential inputs to the sensor.

Tables continued

Table D

Wire color code for MS style ext	ension cable (10-pin MS connector)	Replace 10-pin MS connector on extension cable by installing 6-pin DIN female connector, part no. 560700					
MS pin no.	Color	Pin-out for Analog output	Pin-out for Digital-Pulse output				
A	White	6	6				
В	No connection	No connection	No connection				
С	Gray	2	1				
D	Pink	1	2				
E	Red	5	5				
F	No connection	No connection	No connection				
G & J (Note 1)	Yellow	3 (Note 2)	3 (Notes 3, 4)				
H & K (Note 1)	Green	4 (Note 2)	4 (Notes 3, 4)				

Notes:

1. The MS style extension cable is assembled with the yellow wire connected to pin G only, and the green wire connected to pin H only. However, pins G & J are connected together, and H & K are connected together via the interconnect board within the L-Series sensor model having the MS style connection.

2. If the G-Series sensor is replacing a L-Series sensor where the reverse-acting output, 10 to 0 Vdc, 20 to 4 mA or 20 to 0 mA, is being used, then the wire connections must be changed at the controller. The yellow wire (MS pin G) will now be used for "Programming (RS-485+)" by the G-Series sensor instead of the reverse-acting output. Also, the green wire (MS pin H) will now be used for "Programming (RS-485-)" by the G-Series sensor instead of the return connection for the reverse-acting output. The input connections at the controller will now need to use the pink wire (MS pin D) for the 10 to 0 Vdc, 20 to 4 mA or 20 to 0 mA sensor signal, and the gray wire (MS pin C) for the output return connection.

3. When connecting to an interface/controller that requires single-ended interrogation, always connect the unused interrogation lead, "(+) Start" or "(-) Start" to ground at the controller.

4. For improved noise rejection and stable operation when using external interrogation use the positive and negative interrogation signals, "(+) Start" and "(-) Start", to provide differential inputs to the sensor.

Table E

Female straight exit D6 to male MS connection adapter cables						
1 ft. cable length, standard, for G-Series analog output sensors	Part no. 253245-1					
1 ft. cable length, standard, for G-Series digital-pulse sensors	Part no. 253245-2					
5 ft. cable length, for G-Series analog output sensors	Part no. 253246-1					
5 ft. cable length, for G-Series digital-pulse sensors	Part no. 253246-2					

Note:

For reverse-acting outputs, see Note 2 under Table D.

Table F

If your system has an Analog Output Module (AOM)	If your system has a Digital Interface Box (DIB)
You can connect the GH model sensor directly to your controller/interface card (bypassing the AOM) if: 1. The AOM output is displacement only (voltage or current).	You can connect the GH model sensor directly to your controller/interface card (bypassing the DIB) if:
2. There is no velocity output from the AOM.	The DIB is configured to use 15 or less recirculations.
3. There are no dual channel outputs from the AOM.	Contact MTS Applications Engineering for the appropriate retrofit GH model number,
4. There are no external null or scale adjustment potentiometer inputs to the AOM.	or if you have questions.
Contact MTS Applications Engineering for the appropriate retrofit GH model number, or if you have questions.	

Tables continued

Table G							
GH Model		Installing 6-pin MS female connector, part no. 370015, onto GH model sensor with integral cable					
Integral Wire Color Code	Output for "Square Wave" Neuter (Using "+Stop")	For "R1" connection type: (positive interrogation)	For "R2" connection type: (negative interrogation)				
Gray	(-) Stop	No Connection (note 1)	No Connection (note 1)				
Pink	(+) Stop (Compatible Neuter Output Pulse)	с	С				
Yellow	(+) Start	E	B (note 2)				
Green	(-) Start	B (note 2)	E				
Red or Brown	Supply Voltage (+Vdc)	F	F				
White	DC Ground (for supply)	В	В				

Notes:

 The G-Series output signal, "(-) Stop", is not used when providing the backwards-compatible neuter type connection. However, this signal wire is required for "RS-422 TX –" during serial programming of the sensor. Pin A of the 370015 connector can not be used for this signal since the Analog Output Module (AOM), or the Digital Interface Box (DIB), provides +12 to +14.5 volts output on this pin when connected. Upon installing the 370015 connector the gray wire must be left disconnected, and the serial programming feature of the sensor is no longer available.

2. When connecting to an AOM, or to a DIB, or to a custom interface/controller that requires single-ended interrogation, always connect the unused interrogation lead to ground at the AOM/DIB/Controller.

Table H		
GH Model		Installing 10-pin MS male connector, part no. 370160 (for R3 connection type only), onto the GH model sensor with integral cable
Integral Wire Color Code	Digital pulse Output	Pin No.
Gray	(-) Gate for PWM (-) Stop for Start/Stop	к
Pink	(+) Gate for PWM(+) Stop for Start/Stop	G
Yellow	(+) Interrogation for PWM (note 1)(+) Start for Start/Stop	E (See Note below)
Green	(-) Interrogation for PWM (note 1)(-) Start for Start/Stop	D (See Note below)
Red or Brown	Supply Voltage (+Vdc)	Н
White	DC Ground (for supply)	A

Note:

For improved noise rejection and stable operation when using external interrogation, use the positive and negative interrogation signals, "(+) Start" and "(-) Start", to provide differential inputs to the sensor.



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