

Belt Weighing

Milltronics Belt Scales

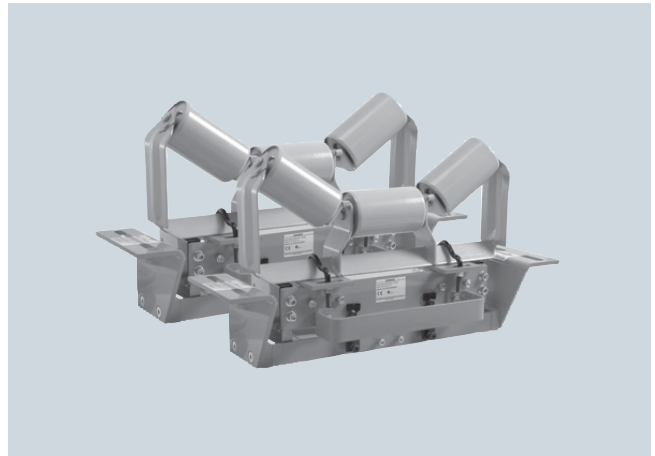
Milltronics MSI and MMI

Overview



Milltronics MSI is a heavy-duty, high accuracy full-frame single idler belt scale used for process and load-out control.

Idler not included with belt scale.



Milltronics MMI is a heavy-duty, high accuracy multiple idler belt scale used for critical process and load-out control.

Idler not included with belt scale.

Benefits

Milltronics MSI Belt Scale

- Outstanding accuracy and repeatability
- Unique parallelogram style load cell design
- Fast reaction to product loading; capable of monitoring fast-moving belts
- Rugged construction
- SABS approval (South Africa) and Measurement Canada

Milltronics MMI Belt Scale

- Exceptional accuracy and repeatability
- Unique parallelogram style load cell design
- Suitable for uneven or light product loading
- Capable of monitoring fast moving belts
- Low cost of ownership
- NTEP and Measurement Canada approved

Application

Milltronics MSI Belt Scale

Milltronics MSI belt scale provides continuous in-line weighing on a variety of products in primary and secondary industries. It is proven in a wide range of tough applications from extraction (in mines, quarries and pits), to power generation, iron and steel, food processing and chemicals. The MSI is suitable for monitoring such diverse products as sand, flour, coal, or sugar.

The MSI's patented use of parallelogram-style load cells results in fast reaction to vertical forces, ensuring instant response to product loading. This enables it to provide outstanding accuracy and repeatability even with uneven loading and fast belt speeds.

Operating with Milltronics BW100, BW500, or SIWAREX FTC microprocessor-based integrators, the MSI provides indication of flow rate, totalized weight, belt load, and belt speed of bulk solid materials. A speed sensor monitors conveyor belt speed for input to the integrator.

The MSI is installed in a simple drop-in operation and may be secured with just four bolts. An existing idler is then attached to the MSI dynamic beam. With no moving parts, maintenance is kept to a minimum, with just periodic calibration checks required.

Milltronics MMI Belt Scale

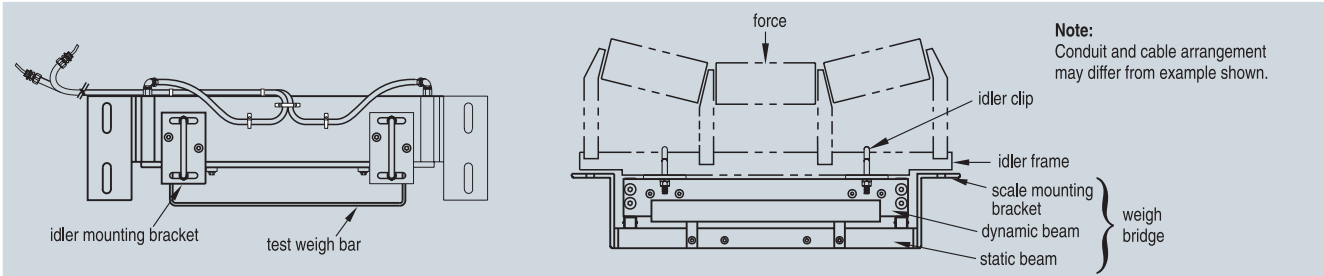
Milltronics MMI belt scale consists of two or more MSI single idler belt scales installed in series. It provides high accuracy continuous in-line weighing on a variety of products in primary and secondary industries. The MMI system is proven in a wide range of tough applications from extraction to power generation, iron and steel, food processing and chemicals. The MMI is suitable for monitoring such diverse products as fertilizer, sand, grain, flour, coal, or sugar.

The MMI's patented use of parallelogram-style load cells results in fast reaction to vertical forces, ensuring instant response to product loading. This enables it to provide outstanding accuracy and repeatability even with uneven or light loading, short idler spacing and fast belt speeds. Operating with Milltronics BW500 or SIWAREX FTC integrator (for custody transfer applications), the MMI provides indication of flow rate, total weight, belt load and belt speed of bulk solids materials on a belt conveyor. A speed sensor monitors conveyor belt speed for input to the integrator.

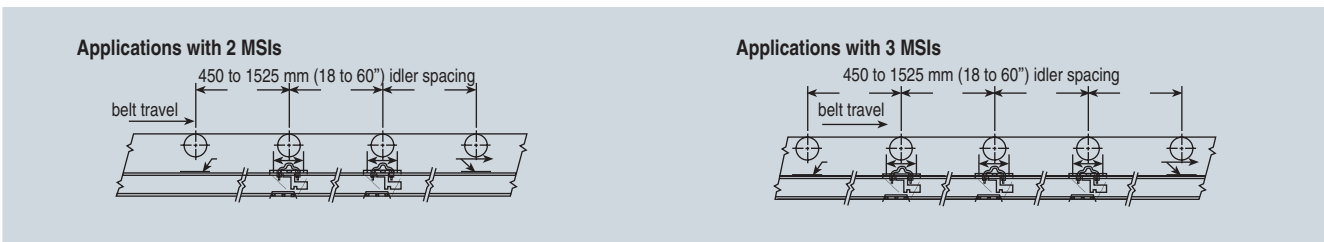
The MMI is installed in a simple drop-in operation and may be secured with just eight bolts and existing idler sets, secured to the dynamic beam. With no moving parts, maintenance is kept to a minimum, with just periodic calibration checks required.

Design

Mounting



MSI/MMI mounting



Mounting (two or more MSI units)

Technical specifications

Mode of operation		Idlers	
Measuring principle	Strain gauge load cells measuring load on belt conveyor idler(s)	Idler profile	<ul style="list-style-type: none"> Flat to 35° Up to 45° with reduced accuracy³⁾
Typical application		Idler diameter	50 ... 180 mm (2 ... 7")
<ul style="list-style-type: none"> MSI MMI 	<ul style="list-style-type: none"> Control in fractionated stone blending tunnels Custody transfer 	Idler spacing	0.5 ... 1.5 m (1.5 ... 5.0 ft)
Measurement accuracy		Load cell	
Accuracy ¹⁾		Construction	17-4 PH (1.4568) stainless steel construction with 304 (1.4301) stainless steel cover.
<ul style="list-style-type: none"> MSI MMI MMI 3 idler 	<ul style="list-style-type: none"> ± 0.5 % or better of totalization over 20 ... 100 % operating range ± 0.25 % or better of totalization over 20 ... 100 % operating range ± 0.125 % or better of totalization over 25 ... 100 % operating range 	Enclosure	IP65
Note: Available with system specification option B only.		Excitation	10 V DC nominal, 15 V DC maximum
Medium conditions		Output	2 ± 0.002 mV/V excitation (nominal) at rated load cell capacity
Material temperature	-40 ... +75 °C (-40 ... +167 °F)	Non-linearity and hysteresis	0.02 % of rated output
Belt design		Non-repeatability	0.01 % of rated output
Belt width	<ul style="list-style-type: none"> 18 ... 96" in CEMA sizes Equivalent to 500 ... 2000 mm in metric size Refer to dimensions section 	Capacity	<ul style="list-style-type: none"> maximum ranges
Belt speed	Up to 5 m/s (1000 fpm) ²⁾	<ul style="list-style-type: none"> 50, 100, 250, 500, 750, 1000, 1250, 1500 lbs 	<ul style="list-style-type: none"> Overload
Capacity	Up to 12000 t/h (13200 stph) at maximum belt speed. Please contact a Siemens representative for higher rates.	<ul style="list-style-type: none"> 150 % of rated capacity, ultimate 300 % of rated capacity 	<ul style="list-style-type: none"> Temperature
Conveyor incline	<ul style="list-style-type: none"> ± 20° from horizontal, fixed incline Up to ± 30° with reduced accuracy³⁾ 	<ul style="list-style-type: none"> -40 ... +75 °C (-40 ... +167 °F) operating range -18 ... +65 °C (0 ... +150 °F) compensated 	Weight
			See dimensions section
		Interconnection wiring (to integrator, per MSI)	<ul style="list-style-type: none"> < 150 m (500 ft) 18 AWG (0.75 mm²) 6 conductor shielded cable > 150 m (500 ft) ... 300 m (1000 ft) 18 ... 22 AWG (0.75 ... 0.34 mm²), 8 conductor shielded cable

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Approvals	<ul style="list-style-type: none"> • CSA/FM Class II, Div. 1, Groups E,F,G and Class III • ATEX II 2D Ex tD A21 IP65 T90 °C • IECEx Ex tD A21 IP65 T90 °C • CE, C-TICK
Metrology Approvals	Measurement Canada, SABS ⁴⁾ , NTEP ⁵⁾

- 1) Accuracy subject to: On factory approved installations the belt scale system's totalized weight will be within the specified accuracy when compared to a known weighed material test sample. The test rate must be within the specified range of the design capacity and held constant for the duration of the test. The minimum material test sample must be equivalent to a sample obtained at the test flow rate for three revolutions of the belt or at least ten minutes running time, whichever is greater.
- 2) Contact Siemens application engineering for consideration of higher belt speeds.
- 3) Review by Siemens application engineer required.
- 4) MSI only.
- 5) MMI only.

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Milltronics MSI and MMI

Selection and Ordering data	Order No.
Milltronics MSI Belt Scale A heavy-duty, high-accuracy single idler belt scale for process and load-out control. For Milltronics MMI belt scale system, two or more MSI belt scales are required. Calibration weights are required and ordered as separate items. Standard, mild steel with polyester paint (compatible with MWL weight calibration system).	C) 7MH7122-
Scale construction Standard duty Hazardous Duty CSA/FM Class II, Div. 1, Groups E,F,G and Class III, ATEX II 2D, IECEx, CE, C-TICK	1 2
Belt width and 'A' dimension 18", 'A' = 27" (686 mm) 19", 'A' = 28" (711 mm) 20", 'A' = 29" (737 mm) 21", 'A' = 30" (762 mm) 22", 'A' = 31" (787 mm) 23", 'A' = 32" (813 mm) 24", 'A' = 33" (838 mm) 25", 'A' = 34" (864 mm) 26", 'A' = 35" (889 mm) 27", 'A' = 36" (914 mm) 28", 'A' = 37" (940 mm) 29", 'A' = 38" (965 mm) 30", 'A' = 39" (991 mm) 31", 'A' = 40" (1016 mm) 32", 'A' = 41" (1041 mm) 33", 'A' = 42" (1067 mm) 34", 'A' = 43" (1092 mm) 35", 'A' = 44" (1118 mm) 36", 'A' = 45" (1143 mm) 37", 'A' = 46" (1168 mm) 38", 'A' = 47" (1194 mm) 39", 'A' = 48" (1219 mm) 40", 'A' = 49" (1245 mm) 41", 'A' = 50" (1270 mm) 42", 'A' = 51" (1295 mm) 43", 'A' = 52" (1321 mm) 44", 'A' = 53" (1346 mm) 45", 'A' = 54" (1372 mm) 46", 'A' = 55" (1397 mm) 47", 'A' = 56" (1422 mm) 48", 'A' = 57" (1448 mm) 49", 'A' = 58" (1473 mm) 50", 'A' = 59" (1499 mm) 51", 'A' = 60" (1524 mm) 52", 'A' = 61" (1549 mm) 53", 'A' = 62" (1575 mm) 54", 'A' = 63" (1600 mm) 55", 'A' = 64" (1626 mm) 56", 'A' = 65" (1651 mm) 57", 'A' = 66" (1676 mm) 58", 'A' = 67" (1702 mm) 59", 'A' = 68" (1727 mm) 60", 'A' = 69" (1753 mm) 61", 'A' = 70" (1778 mm) 62", 'A' = 71" (1803 mm) 63", 'A' = 72" (1829 mm) 64", 'A' = 73" (1854 mm) 65", 'A' = 74" (1880 mm) 66", 'A' = 75" (1905 mm) 67", 'A' = 76" (1930 mm) 68", 'A' = 77" (1956 mm)	AA AB AC AD AE AF AG AH AJ AK AL AM AN AP AQ AR AS AT AU AV AW BA BB BC BD BE BF BG BH BJ BK BL BM BN BP BQ BR BS BT BU BV BW CA CB CC CD CE CF CG CH CJ

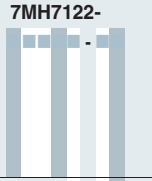
Selection and Ordering data	Order No.
Milltronics MSI Belt Scale A heavy-duty, high-accuracy single idler belt scale for process and load-out control. For Milltronics MMI belt scale system, two or more MSI belt scales are required. Calibration weights are required and ordered as separate items. Standard, mild steel with polyester paint (compatible with MWL weight calibration system).	C) 7MH7122-
69", 'A' = 78" (1981 mm) 70", 'A' = 79" (2007 mm) 71", 'A' = 80" (2032 mm) 72", 'A' = 81" (2057 mm) 73", 'A' = 82" (2083 mm) 74", 'A' = 83" (2108 mm) 75", 'A' = 84" (2134 mm) 76", 'A' = 85" (2159 mm) 77", 'A' = 86" (2184 mm) 78", 'A' = 87" (2210 mm) 79", 'A' = 88" (2235 mm) 80", 'A' = 89" (2261 mm) 81", 'A' = 90" (2286 mm) 82", 'A' = 91" (2311 mm) 83", 'A' = 92" (2337 mm) 84", 'A' = 93" (2362 mm) 85", 'A' = 94" (2388 mm) 86", 'A' = 95" (2413 mm) 87", 'A' = 96" (2438 mm) 88", 'A' = 97" (2464 mm) 89", 'A' = 98" (2489 mm) 90", 'A' = 99" (2515 mm) 91", 'A' = 100" (2540 mm) 92", 'A' = 101" (2565 mm) 93", 'A' = 102" (2591 mm) 94", 'A' = 103" (2616 mm) 95", 'A' = 104" (2642 mm) 96", 'A' = 105" (2667 mm)	CK CL CM CN CP CQ CR CS CT CU CV CW DA DB DC DD DE DF DG DH DJ DK DL DM DN DP DQ DR
Stainless steel load cell [17-4 PH (1.4568) stainless steel construction with 304 (1.4301) stainless steel cover] Not specified 50 lb (22.7 kg) 100 lb (45.4 kg) 250 lb (113.4 kg) 500 lb (226.8 kg) 750 lb (340.2 kg) 1000 lb (453.6 kg) 1250 lb (567 kg) ¹⁾ 1500 lb (680.4 kg) ¹⁾	0 1 2 3 4 5 6 7 8

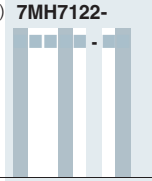
¹⁾ Available with Fabrication options 11 and 41 only, and with System specification option A only.

C) Subject to export regulations AL: N, ECCN: EAR99

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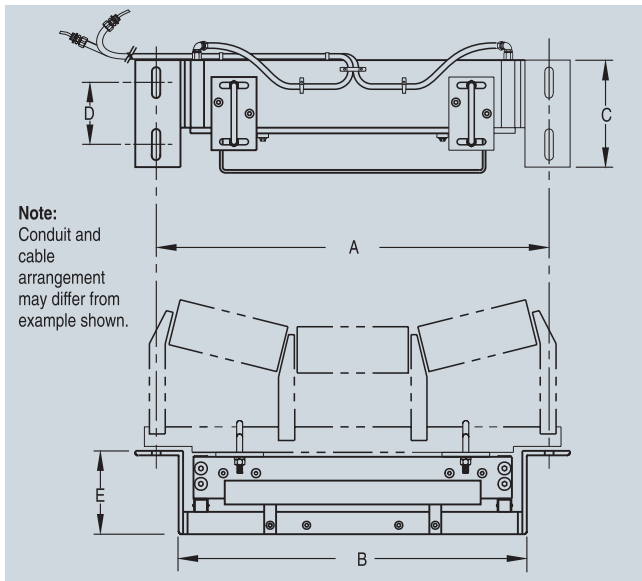
Milltronics MSI and MMI

Selection and Ordering data	Order No.
Milltronics MSI Belt Scale A heavy-duty, high-accuracy single idler belt scale for process and load-out control. For Milltronics MMI belt scale system, two or more MSI belt scales are required. Calibration weights are required and ordered as separate items. Standard, mild steel with polyester paint (compatible with MWL weight calibration system).	C) 7MH7122- 
Fabrication Polyester painted mild steel <u>Stainless steel 304 (1.4301), for belt width scales:</u> 18" to 29" (457.2 to 736.6 mm) 30" to 41" (762 to 1041.4 mm) 42" to 53" (1066.8 to 1346.2 mm) 54" to 65" (1371.6 to 1651 mm) 66" to 77" (1676.4 to 1955.8 mm) 78" to 89" (1981.2 to 2260.6 mm) 90" to 96" (2786 to 2438.4 mm) <u>Stainless steel 316 (1.4401), for belt width scales:</u> 18" to 29" (457.2 to 736.6 mm) 30" to 41" (762 to 1041.4 mm) 42" to 53" (1066.8 to 1346.2 mm) 54" to 65" (1371.6 to 1651 mm) 66" to 77" (1676.4 to 1955.8 mm) 78" to 89" (1981.2 to 2260.6 mm) 90" to 96" (2786 to 2438.4 mm) Polyester painted mild steel (compatible with MWL weight calibration system)	1 1 2 1 2 2 2 3 2 4 2 5 2 6 2 7 3 1 3 2 3 3 3 4 3 5 3 6 3 7 4 1
System specification Standard MSI and MMI NTEP Certified MMI ^{2) 3) 4)}	A B
Instruction manual <u>MSI Manuals</u> English German French Spanish <u>MMI Manuals</u> English German <u>Belt Scale Application Guidelines</u> • English • French • German • Spanish Hazardous location certificates	C) 7ML1998-5CY02 C) 7ML1998-5CY32 C) 7ML1998-1CY11 C) 7ML1998-1CY21 C) 7ML1998-5DR03 C) 7ML1998-5DR33 C) 7ML1998-5GA01 C) 7ML1998-5GA11 C) 7ML1998-5GA31 C) 7ML1998-5GA21 C) 7ML1998-5KH81
Note: The instruction manual and application guidelines manual should be ordered as separate items on the order. This device is shipped with the Siemens Milltronics manual CD containing the complete instruction manual library.	

Selection and Ordering data	Order No.
Milltronics MSI Belt Scale A heavy-duty, high-accuracy single idler belt scale for process and load-out control. For Milltronics MMI belt scale system, two or more MSI belt scales are required. Calibration weights are required and ordered as separate items. Standard, mild steel with polyester paint (compatible with MWL weight calibration system).	C) 7MH7122- 
Spare parts MWL calibration weight support brackets <u>Stainless steel load cell</u> [17-4 PH (1.4568) stainless steel construction with 304 (1.4301) stainless steel cover] 50 lb (22.7 kg) 100 lb (45.4 kg) 250 lb (113.4 kg) 500 lb (226.8 kg) 750 lb (340.2 kg) 1000 lb (453.6 kg) 1250 lb (567 kg) 1500 lb (680.4 kg) 100 lb (45.4 kg), NTEP 250 lb (113.4 kg), NTEP 500 lb (226.8 kg), NTEP 750 lb (340.2 kg), NTEP 1000 lb (453.6 kg), NTEP 50 lb (22.7 kg), CSA/FM/ATEX/IECEX 100 lb (45.4 kg), CSA/FM/ATEX/IECEX 250 lb (113.4 kg), CSA/FM/ATEX/IECEX 500 lb (226.8 kg), CSA/FM/ATEX/IECEX 750 lb (340.2 kg), CSA/FM/ATEX/IECEX 1000 lb (453.6 kg), CSA/FM/ATEX/IECEX 1250 lb (567 kg), CSA/FM/ATEX/IECEX 1500 lb (680.4 kg), CSA/FM/ATEX/IECEX	C) 7MH7723-1FW C) 7MH7725-1AC C) 7MH7725-1AD C) 7MH7725-1AE C) 7MH7725-1AF C) 7MH7725-1AG C) 7MH7725-1AH C) 7MH7725-1EA C) 7MH7725-1EB C) 7MH7725-1DB C) 7MH7725-1DC C) 7MH7725-1DD C) 7MH7725-1DE C) 7MH7725-1DF C) 7MH7725-1DT C) 7MH7725-1DU C) 7MH7725-1DV C) 7MH7725-1DW C) 7MH7725-1DX C) 7MH7725-1DY C) 7MH7725-1EE C) 7MH7725-1EF
<u>Idler Clip</u> 5" (127 mm) for 27" to 62" (686 mm to 1575 mm) 'A' dimensions 7" (178 mm) for 63" to 74" (1600 mm to 1880 mm) 'A' dimensions	7MH7723-1BT 7MH7723-1DF
Calibration Weights 6.0 lb / 2.7 kg 18 lb / 8.2 kg Milltronics flat bar calibration weights, see page 4/50	7MH7724-1AB 7MH7724-1AA
¹⁾ Available with Fabrication options 11 and 41 only, and with System specification option A only. ²⁾ Two MSI are required to make the NTEP approved MMI ³⁾ NTEP approval not available with 50, 1250 and 1500 lb load cells ⁴⁾ Required for MMI 3 idler, 0.125% accuracy C) Subject to export regulations AL: N, ECCN: EAR99	

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Dimensional drawings



MSI dimensions

Conveyor belt width	Mounting scale width 'A'	Minimum drop-in width 'B'	C"	D"	E"	Weight (approx.)
18" (457 mm)	27" (686 mm)	23.25" (591 mm)	9.5" (241 mm)	5.5" (140 mm)	7" (178 mm)	82 lbs (37 kg)
20" (508 mm)	29" (737 mm)	25.25" (641 mm)	9.5" (241 mm)	5.5" (140 mm)	7" (178 mm)	85 lbs (39 kg)
24" (610 mm)	33" (838 mm)	29.25" (743 mm)	9.5" (241 mm)	5.5" (140 mm)	7" (178 mm)	90 lbs (41 kg)
30" (762 mm)	39" (991 mm)	35.25" (895 mm)	9.5" (241 mm)	5.5" (140 mm)	7" (178 mm)	99 lbs (45 kg)
36" (914 mm)	45" (1143 mm)	41.25" (1048 mm)	9.5" (241 mm)	5.5" (140 mm)	7" (178 mm)	107 lbs (49 kg)
42" (1067 mm)	51" (1295 mm)	47.25" (1200 mm)	9.5" (241 mm)	5.5" (140 mm)	7" (178 mm)	116 lbs (53 kg)
48" (1219 mm)	57" (1448 mm)	53.25" (1353 mm)	9.5" (241 mm)	5.5" (140 mm)	7" (178 mm)	125 lbs (57 kg)
54" (1372 mm)	63" (1600 mm)	59.25" (1505 mm)	12" (305 mm)	8" (203 mm)	7" (178 mm)	175 lbs (79 kg)
60" (1524 mm)	69" (1753 mm)	65.25" (1657 mm)	12" (305 mm)	8" (203 mm)	7" (178 mm)	193 lbs (88 kg)
66" (1676 mm)	75" (1905 mm)	71.25" (1810 mm)	12" (305 mm)	8" (203 mm)	8" (203 mm)	229 lbs (104 kg)
72" (1829 mm)	81" (2057 mm)	77.25" (1962 mm)	12" (305 mm)	8" (203 mm)	8" (203 mm)	247 lbs (112 kg)

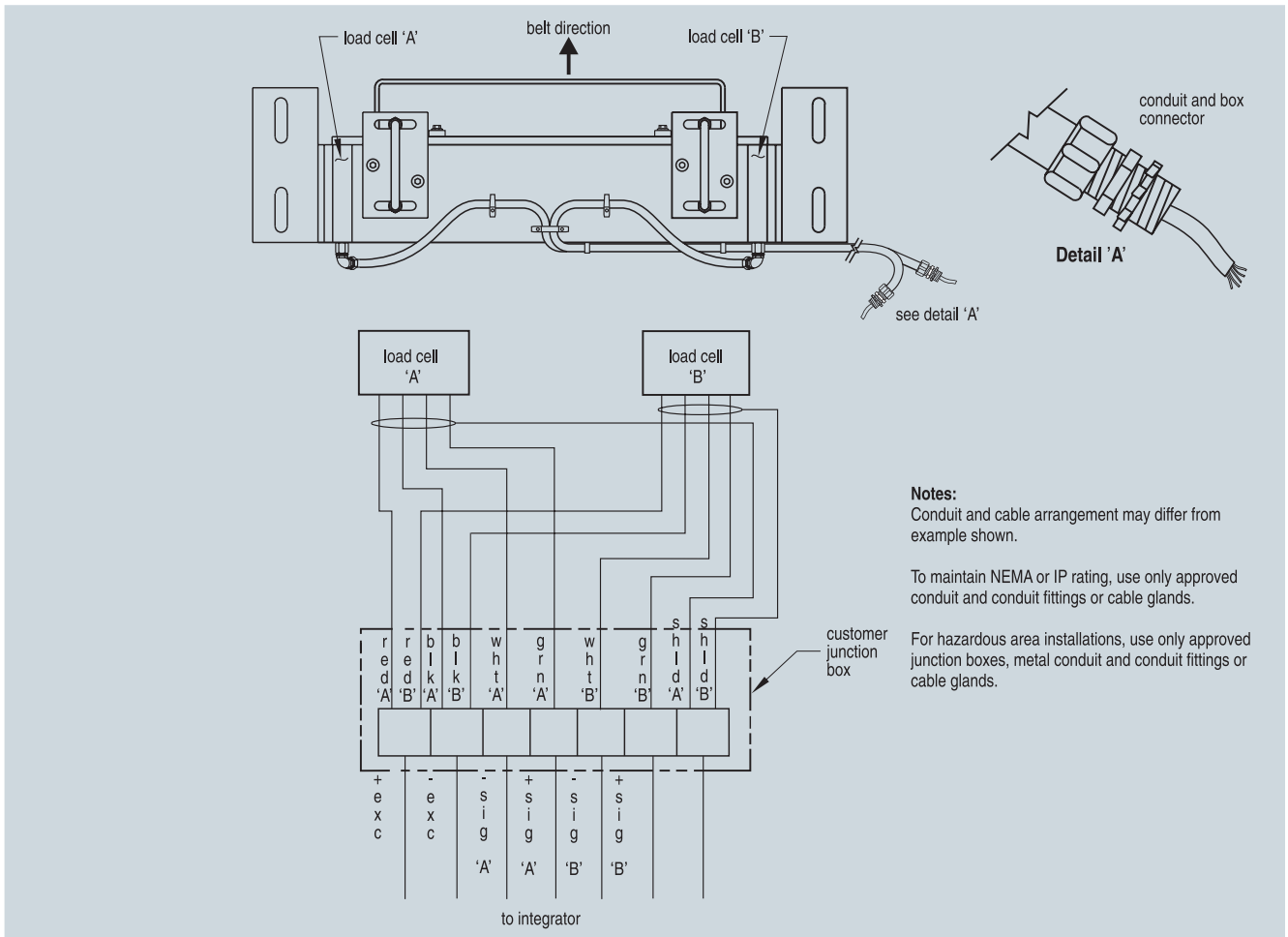
Other widths available - check configuration information. Sizes are from 18" (457 mm) to 96" (2438 mm) in 1" (25.4 mm) increments. All sizes are nominal.

Note: Dimension B must be approx. 3/8" or 10 mm less than Y dimension of the conveyor (see Application Questionnaire on 4/4).

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Milltronics MSI and MMI

Schematics



MSI/MMI connections

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