The following pages are an excerpt from the North American Product Technical Guide, Volume 1: Direct Fastening Technical Guide, Edition 24.

Please refer to the publication in its entirety for complete details on this product including data development, base materials, general suitability, installation, corrosion, and product specifications.

Direct Fastening Technical Guide, Edition 24

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3.2.18 X-MW MECHANICAL / ELECTRICAL CLIPS AND HANGERS

3.2.18.1 PRODUCT DESCRIPTION

X-MW MX Wire hanging system
For fastening heating, ventilation, and air condition (HVAC), and lighting to ceiling. System can be used with battery-actuated tools and X-P 20 B3/B4 MX, and X-S 14 B3/B4 MX fasteners. Wire length is from 6 ft up to 20 ft. System utilizes loop lock and wire holder.

X-MW ALH Wire hanging system
For fastening heating, ventilation, and air condition (HVAC), cable tray, conduit rack and lighting to ceiling. System is pre-mounted with X-ALH 22, X-ALH 27 or X-ALH 32 powder-actuated fasteners. Wire length is from 6 ft up to 20 ft. System utilizes loop lock or channel lock.

3.2.18.1 Product Description
3.2.18.2 Material Specifications
3.2.18.3 Technical Data
3.2.18.4 Ordering Information

Listings / Approvals

ICC-ES (International Code Council)

ESR-2795 with LABC/LARC Supplement

UL (Underwriters Laboratories)
File 505298 under UL2239 for X-MW ALH27 CL and X-MW ALH32 CL

File 517614 under UL1598 for X-MW MX, X-MW ALH27 L and X-MW ALH32 L

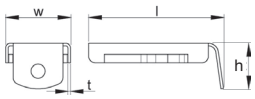
3.2.18.2 MATERIAL SPECIFICATIONS

Description	Material	Coating	Minimum Coating Thickness
X-MW MX	Carbon steel	Zinc	3 µm
X-MW ALH	Carbon steel	Zinc	3 µm
Loop lock	Aluminum + brass	Nickel	-
Channel lock	Steel + brass	Zinc + Nickel	-
Wire	Carbon steel	Zinc	3 µm

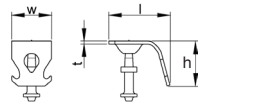
Dimensions

Clip Designation	Width of Wire Holder Plate	Length of Wire Holder Plate	Height of Cable Holder	Thickness Cable Holder Plate
	w	l	h	t
X-MW MX	1.18"	2.56"	0.82"	0.03"
X-MW ALH	0.79"	1.18"	0.89"	0.03"

X-MW MX

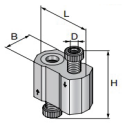


X-MW ALH



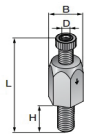
Description	Width of Cable Lock W in. (mm)	Length of Cable Lock L in. (mm)	Height of Cable Lock H in. (mm)
MW-L Loop Lock 2.0	1/2" (12.4)	15/16" (23.1)	1-11/16" (42.5)

Loop lock



Description	Width of Cable Lock B in. (mm)	Length of Cable Lock L in. (mm)	Thread Diameter H in. (mm)	Thread Length H in. (mm)
MW-CL Channel Lock	1-1/4" (32.5)	2-1/4" (58)	3/8" (10)	1" (25)

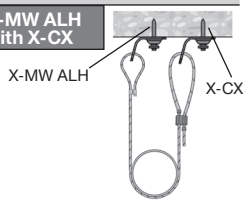
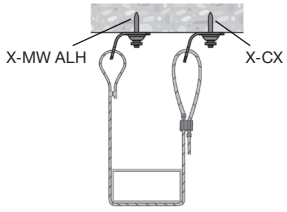
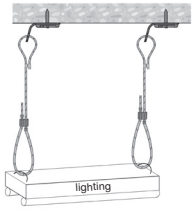
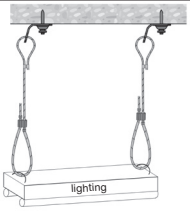
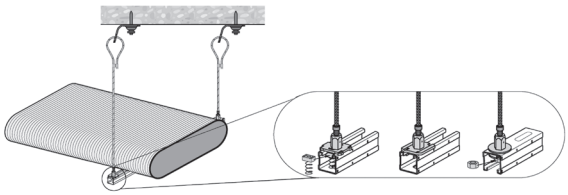
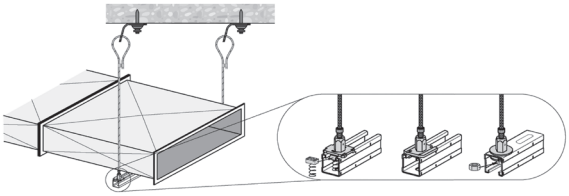
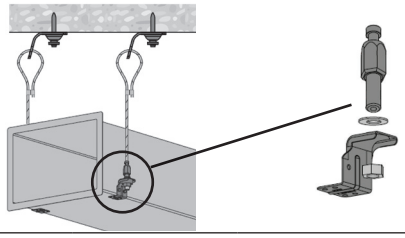
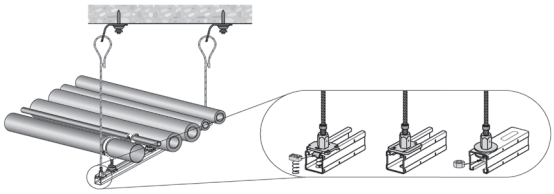
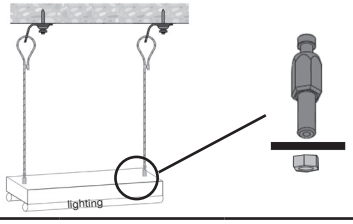
Channel lock



Cable Size	Diameter	Available Lengths
No. 2.0	5/64"	6ft, 10ft, 20ft

No. 2 cable wire

Applications

Lock Type	Typical Application	
	Spiral HVAC	**X-MW MX** **X-MW ALH** **X-MW ALH with X-CX** 
	Rectangular HVAC	**X-MW ALH with X-CX** 
	Lighting or misc.	**X-MW MX**  **X-MW ALH** 
	Spiral HVAC	**X-MW ALH with MQA** 
	Rectangular HVAC	**X-MW ALH with MQA**  **X-MW ALH with MVA** 
	Conduit or Cable Tray	**X-MW ALH with MQA** 
	Lighting	**X-MW AL** 

3.2.18.3 TECHNICAL DATA

Performance Data

Allowable loads in normal weight concrete[1, 2]

Description	Fastener	Shank Diameter in. (mm)	Concrete compressive strength			
			4000 psi		6000 psi	
			Tension lb (kN)	45-Degree lb (kN)	Tension lb (kN)	45-Degree lb (kN)
X-MW wire hanger with pre-mounted fastener	X-ALH 22	0.177 (4.5)	60 (0.27)	100 (0.44)	60 (0.27)	60 (0.27)
	X-ALH 27	0.177 (4.5)	100 (0.44)	100 (0.44)	100 (0.44)	100 (0.44)
	X-ALH 32	0.177 (4.5)	100 (0.44)	100 (0.44)	100 (0.44)	100 (0.44)
X-MW MX wire hanger	X-P 20 B3/B4 MX, X-P 24 B3/B4 MX	0.118 (3.0)	30 (0.13)	-	-	-

1. The tabulated allowable load values are for the low-velocity fasteners only, using a safety factor that is greater than or equal to 5.0, calculated in accordance with ICC-ES AC70.
2. Multiple fasteners are recommended for any attachment.

Allowable loads in minimum f'_c = 3000 psi structural lightweight concrete[1, 2]

Description	Fastener	Shank Diameter in. (mm)	Fastener Location			
			Installed through 3" deep metal deck into concrete			
			Upper Flute		Lower Flute	
			Tension lb (kN)	45-Degree lb (kN)	Tension lb (kN)	45-Degree lb (kN)
X-MW wire hanger with pre-mounted fastener	X-ALH 22	0.177 (4.5)	100 (0.44)	100 (0.44)	90 (0.40)	100 (0.44)
	X-ALH 27	0.177 (4.5)	100 (0.44)	100 (0.44)	100 (0.44)	100 (0.44)
	X-ALH 32	0.177 (4.5)	100 (0.44)	100 (0.44)	100 (0.44)	100 (0.44)
X-MW MX wire hanger	X-P 20 B3/B4 MX, X-P 24 B3/B4 MX	0.118 (3.0)	80 (0.36)	-	60 (0.27)	-

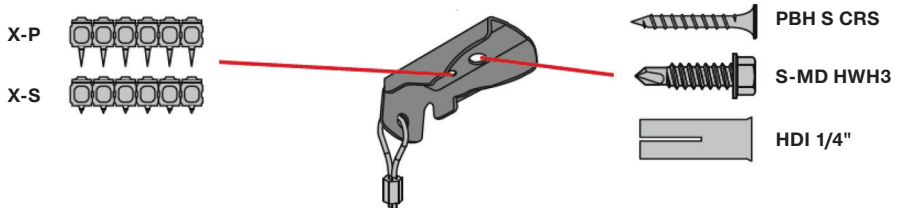
1. The tabulated allowable load values are for the low-velocity fasteners only using a safety factor that is greater than or equal to 5.0, calculated in accordance with ICC-ES AC70. Multiple fasteners are recommended for any attachment.
2. 2 The steel deck profile for the 3" deep composite floor deck has a minimum thickness of 20 gauge (0.0358") and a minimum F_y = 33 ksi. Lower and upper flute width must be a minimum of 3-7/8". Figure 1 in Section 3.2.1.6 shows the nominal flute dimensions, fastener locations and load orientations for the deck profile. Structural light weight concrete fill above top of steel deck must be minimum 3-1/4".

Allowable loads in minimum ASTM A36 (F_y≥36 ksi; F_u≥58 ksi) steel[1, 2, 3]

Description	Fastener	Shank Diameter in. (mm)	Steel Thickness in. (mm)		
			3/16" (4.8)	1/4" (6.4)	1/2" (12.7)
			Tension lb (kN)	Tension lb (kN)	Tension lb (kN)
X-MW MX wire hanger	X-S 14 B3/B4	0.118 (3.0)	90 (0.40)	85 (0.38)	80 (0.36)

1. The tabulated allowable load values are for the low-velocity fasteners only, using a safety factor that is greater than or equal to 5.0, calculated in accordance with ICC-ES AC70.
2. Multiple fasteners are recommended for any attachment.
3. For allowable loads of X-CX ALH 22, reference Section 3.3.2 X-CX Ceiling Clip.

Allowable load when installing X-MW MX with PHB S CRS wood screw, S-MD HWH3 or HDI 1/4"

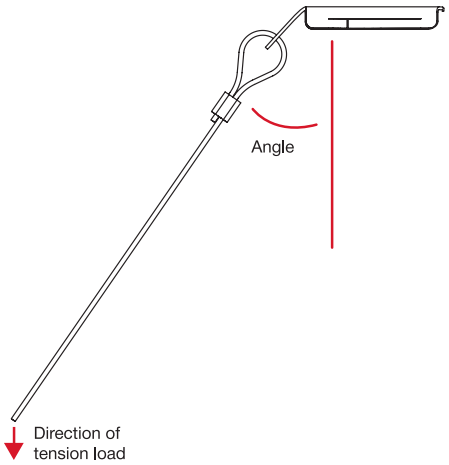


X-MW MX clip can be either installed with a X-P or X-S Battery-actuated Fastener through the smaller hole or an HDI 1/4" anchor or screws through the larger hole. When installed using anchor or screws, 30 lbs (0.13 kN) allowable load using a safety factor of 5.0 can be used. Reference X-MW MX installation instruction for more information.

Load reduction with wire hanger angle [1,2,3]

Angle from vertical	0°	15°	30°	45°	60°
Load adjustment factor	1.00	0.96	0.86	0.70	0.50

1. The tabulated load adjustment values are for loads in the vertical down orientation as depicted in the accompanying figure.
2. Fastener and clip installation shall be such that the angle of the wire extends away from the nail.
3. Load adjustment factor shall be multiplied by the applicable X-MW allowable load.



Spiral HVAC single wall with 10' hanging space[1]

Diameter	Circumference	Weight (lbs)		
		26 Gauge	24 Gauge	22 Gauge
8"	2' 2"	23	29	36
12"	3' 2"	35	44	54
16"	4' 2"	47	59	72
20"	5' 3"	58	73	90
24"	6' 3"	70	88	108
28"	7' 4"	81	103	126
32"	8' 5"	93	117	144
36"	9' 5"	105	132	162

Spiral HVAC double wall with 10' hanging space[1]

Inside Diameter	Outside Gauge	Inside Gauge	Weight per ft. (lb/ft)
8"	26	26	6
12"	26	26	8

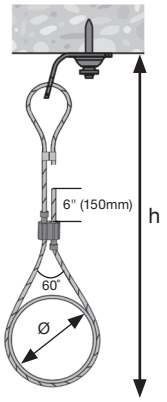
Weight of rectangular duct, based on 8' and 10' hanging space[1]

Rectangle Duct Size (height + width)	Weight per ft.		Weight / 8 ft.	Weight / 10 ft.
	20 Gauge	22 Gauge		
8 x 6"	-	3.57	28.56	35.70
10 x 6"	-	4.08	32.64	40.80
12 x 6"	-	4.59	36.72	45.90
14 x 10"	-	6.12	48.96	61.20
16 x 16"	-	8.16	65.28	81.60
24 x 12"	-	9.18	73.44	91.80
36 x 18"	-	13.77	110.16	137.70
40 x 22"	18.34	-	146.73	183.42
50 x 20"	20.71	-	165.67	207.08

1. Weight per foot is calculated based on SMACNA HVAC Systems Duct Design.

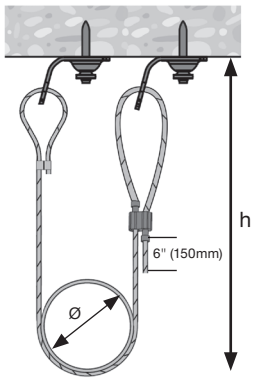
Hanger length charts for spiral HVAC with one fastening point using BX/DX loop lock

Required Elevation h (ft.)	1	3	5	8	10	12	15
Diameter Ø (in.)	Cable Length l (ft.)						
8"	3	5	7	10	12	14	17
12"	4	6	8	11	13	15	18
16"	6	8	8	11	13	15	18
20"	7	9	9	12	14	16	19
24"	9	11	10	13	15	17	20
28"	10	12	11	14	16	18	-
32"	12	14	11	14	16	18	-
36"	13	15	12	15	17	19	-



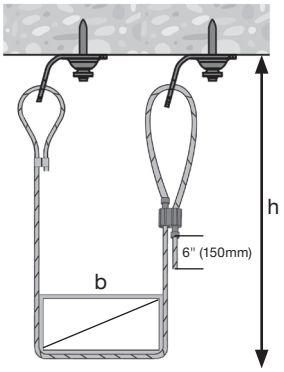
Hanger length charts for spiral HVAC with two fastening points using DX loop lock

Required Elevation h (ft.)	1	2	3	4	5	7	9
Diameter Ø (in.)	Cable Length l (ft.)						
8"	3	5	7	9	11	15	19
12"	3	5	7	9	11	15	19
16"	3	5	7	9	11	15	19
20"	3	5	7	9	11	15	19
24"	4	6	8	10	12	16	20
28"	4	6	8	10	12	16	20
32"	4	6	8	10	12	16	20
36"	4	6	8	10	12	16	20



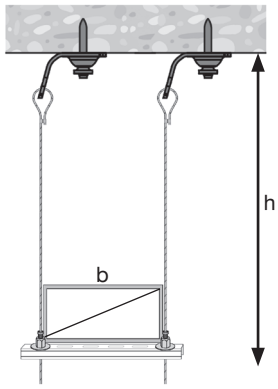
Hanger length charts for rectangular HVAC with two fastening points using DX loop lock

Required Elevation h (ft.)	1	2	3	4	5	7	9
Width b (in.)	Cable Length l (ft.)						
8"	3	5	7	9	11	15	19
12"	3	5	7	9	11	15	19
16"	3	5	7	9	11	15	19
20"	3	5	7	9	11	15	19
24"	4	6	8	10	12	16	20
28"	4	6	8	10	12	16	20
32"	4	6	8	10	12	16	20
36"	4	6	8	10	12	16	20



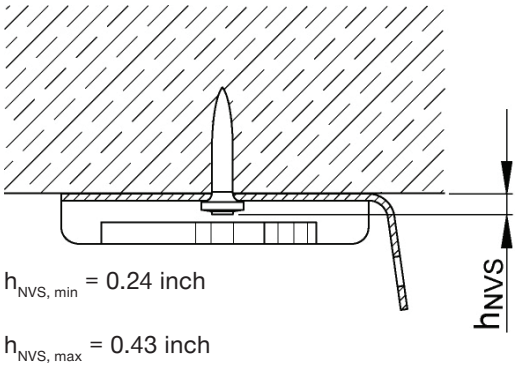
Hanger length charts for rectangular HVAC with two fastening points using DX channel lock

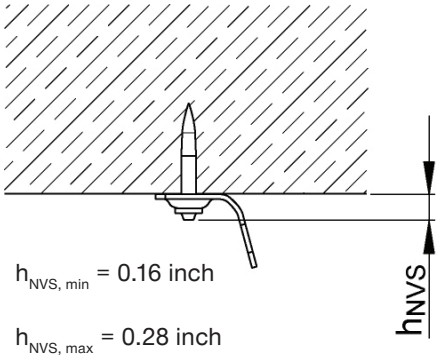
Required Elevation h (ft.)	1	2	3	4	5	7	9
Width b (in.)	Cable Length l (ft.)						
8"	1.5	2.5	3.5	4.5	5.5	7.5	9.5
12"	1.5	2.5	3.5	4.5	5.5	7.5	9.5
16"	1.5	2.5	3.5	4.5	5.5	7.5	9.5
20"	1.5	2.5	3.5	4.5	5.5	7.5	9.5
24"	1.5	2.5	3.5	4.5	5.5	7.5	9.5
28"	1.5	2.5	3.5	4.5	5.5	7.5	9.5
32"	1.5	2.5	3.5	4.5	5.5	7.5	9.5
36"	1.5	2.5	3.5	4.5	5.5	7.5	9.5



6" (150mm)

Fastening Quality Assurance
Fastening standoff





3.2.18.4 ORDERING INFORMATION

Fastener Description	Fastener Length in. (mm)	Fastener Shank Ø in. (mm)	Lock Type	Wire Ø in. (mm)	Wire Length ft. (m)
Without pre-mounted fastener					
X-MW MX L	-	-	Loop	0.08" (2.0)	6.6 (2)
X-MW MX L	-	-	Loop	0.08" (2.0)	10 (3)
X-MW MX L	-	-	Loop	0.08" (2.0)	20 (6.1)
With pre-mounted fastener					
X-MW ALH 22 L 10ft/3m	0.87" (22)	0.177" (4.5)	Loop	0.08" (2.0)	10 (3)
X-MW ALH 27 L 6ft/2m	1" (27)	0.177" (4.5)	Loop	0.08" (2.0)	6.6 (2)
X-MW ALH 27 L 10ft/3m	1" (27)	0.177" (4.5)	Loop	0.08" (2.0)	10 (3)
X-MW ALH 27 L 20ft/6m	1" (27)	0.177" (4.5)	Loop	0.08" (2.0)	20 (6.1)
X-MW ALH 32 L 10ft/3m	1.26" (32)	0.177" (4.5)	Loop	0.08" (2.0)	10 (3)
X-MW ALH 27 CL 6ft/2m	1" (27)	0.177" (4.5)	Channel	0.08" (2.0)	6.6 (2)
X-MW ALH 27 CL 10ft/3m	1" (27)	0.177" (4.5)	Channel	0.08" (2.0)	10 (3)
X-MW ALH 27 CL 20ft/6m	1" (27)	0.177" (4.5)	Channel	0.08" (2.0)	20 (6.1)
X-MW ALH 32 CL 10ft/3m	1.26" (32)	0.177" (4.5)	Channel	0.08" (2.0)	10 (3)