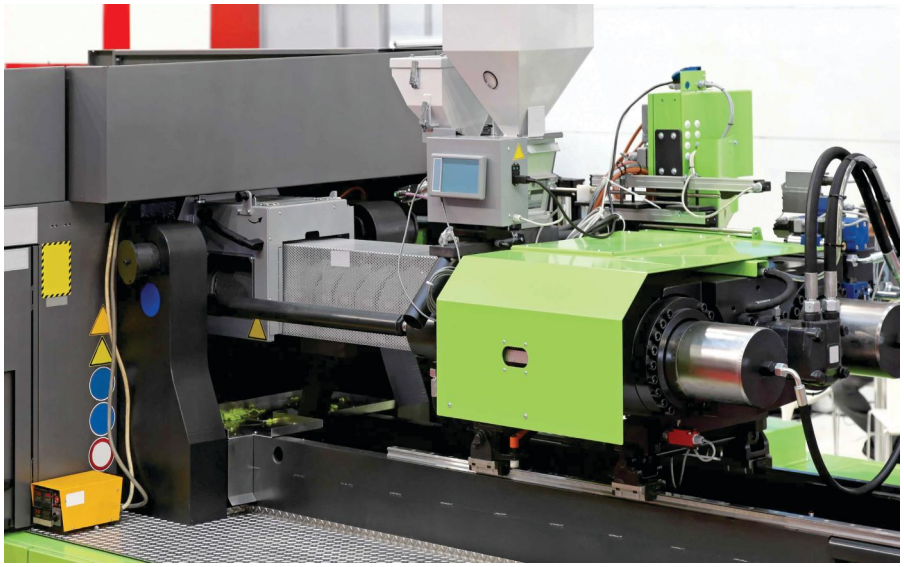
INOVANCE



Dedicated Application Solution MD330H

YOUR PARTNER FOR INDUSTRIAL AUTOMATION SOLUTIONS

About INOVANCE

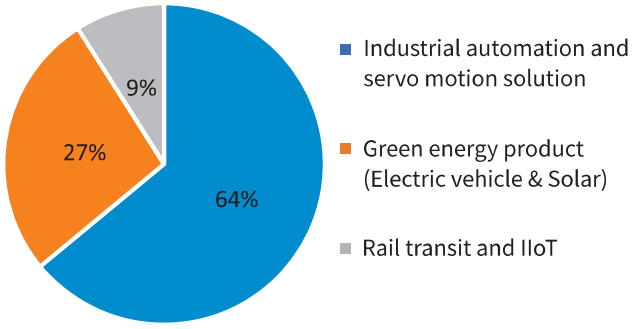
The Inovance Group was founded in 2003 in Shenzhen, a city in one of China's most successful Special Economic Zones. It made its initial public offering on the Shenzhen Stock Exchange in 2010* and has since been tracked by Forbes as an SME with most potential. Rapid growth in sales revenues and staff numbers led to the Group's selection for the Forbes 2016 Best under a Billion list, which highlights Asia-Pacific companies with less than $1bn in sales but consistently high top and bottom-line gains.

As a young and dynamic organization, the Group has established an effective structure on which to realize its promising future. Its aim is to become one of the leading providers of industrial automation products and solutions, something that it believes can best be achieved by helping more and more customers to succeed in their own objectives through close co-operation as partners.

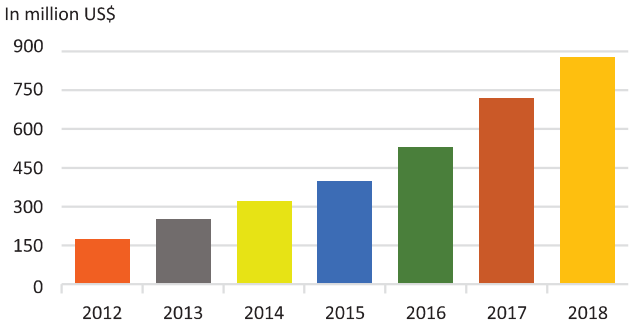
Customers find more than just products when they work with the Inovance Group. They gain access to world-class manufacturing facilities and highly skilled sector-specialists. It is this combination of flexible production techniques and in-depth understanding of the requirements of a given sector that enables business units within the Group to deliver comprehensive solutions

Exceptional R&D Facilities

The Group's R&D teams utilize best in class design software (Pro Engineer, Mentor Flotherm, AnSoft, Windchill PLM) for new product design and development. Significant integrity testing of assemblies and beta products are carried out inhouse to validate the design targets in environmental, mechanical, thermal and motor drive performances. Inovance R&D expenditure is 12% of sales revenue for 2018



Sales from 2012 to 2018



Forward, Always Progressing

The Inovance Group continues to move forward and in 2018 achieved sales revenues of USD 880M, a 24% growth from 2017. Through sustained innovation, the Group delivers new technology products for the industrial automation market and pursues new opportunities in the New Energy sectors of Electric Vehicle and Light Rail Transit inverters. Since its foundation in 2003, Inovance has delivered several millions of power inverters to a wide spectrum ofindustries and has made significant progress in delivering cost-competitive control solutions

Certification

With markets ever more strongly regulated, certifications are vital to an international future. All of the Group's latest products are designed to comply with CE standards and UL when specified. The R&D compliance department works with internationally recognized testing bodies such as the German TÜV companies, UL listed test labs, TÜV Rheinland for Functional Safety and Liftinstituut for Elevator Safety

EN 61800-3 ISO 9001:2008
OHSAS 18001:2007 IS0 14001:2015

inova automation by INOVANCE

"We Pioneered in providing the Dedicated Application Solution Products for Elevators, Plastic Injection, Compressors, Textiles (Loom, Roving and TFO) HVAC, Cranes, Winders - Unwinders (Textiles/Metal/Paper/Plastic) & High Precision Servo Motion"

Integrated Elevator Drive Solutions Worldwide successful installation >1,700,000 sets

Inova Automation was founded in 2012, 100% subsidiary of INOVANCE. With an international export office established in Hong Kong, other offices followed in the important markets of India, Turkey, Iran, France, Germany and Italy through which European technology is now feeding into the Group' s engineering design processes for next gen global products. (*Stock name INOVANCE) stock code 300124

Driven by Application Technology

MD810 - Multi-rack Drive System Solution

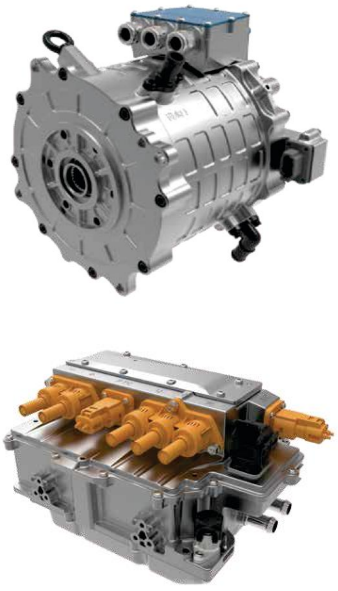
Servo Hydraulic Solution

CP700 - Screw Air Compressor Solution

CS710 - Industrial Crane Solution

MD330H- Winder / Unwinder Solution

Textile Solution



Electric Vehicle Solution

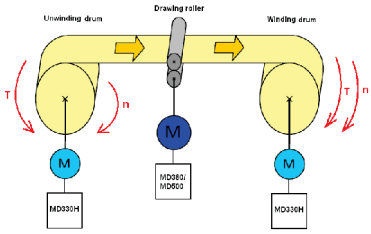
MD330H- Dedicated Drive Solution for Tension Control

Typical Control Methods can be achieved by MD330H

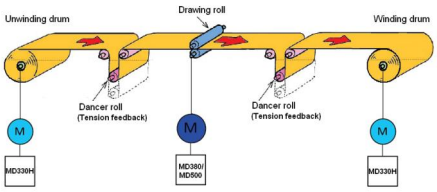
CE

TÜV SÜD

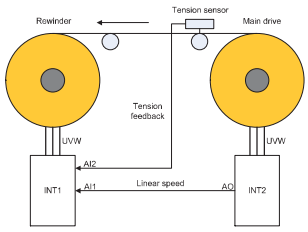
OPEN LOOP TORQUE CONTROL



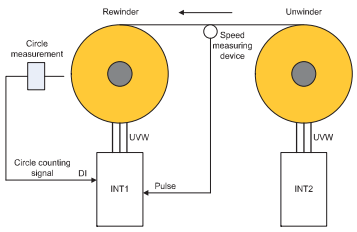
CLOSED LOOP SPEED CONTROL



CLOSED LOOP TORQUE CONTROL



CONSTANT LINEAR SPEED CONTROL



Field Bus - Optional

CANlink CANopen Modbus PROFIBUS®

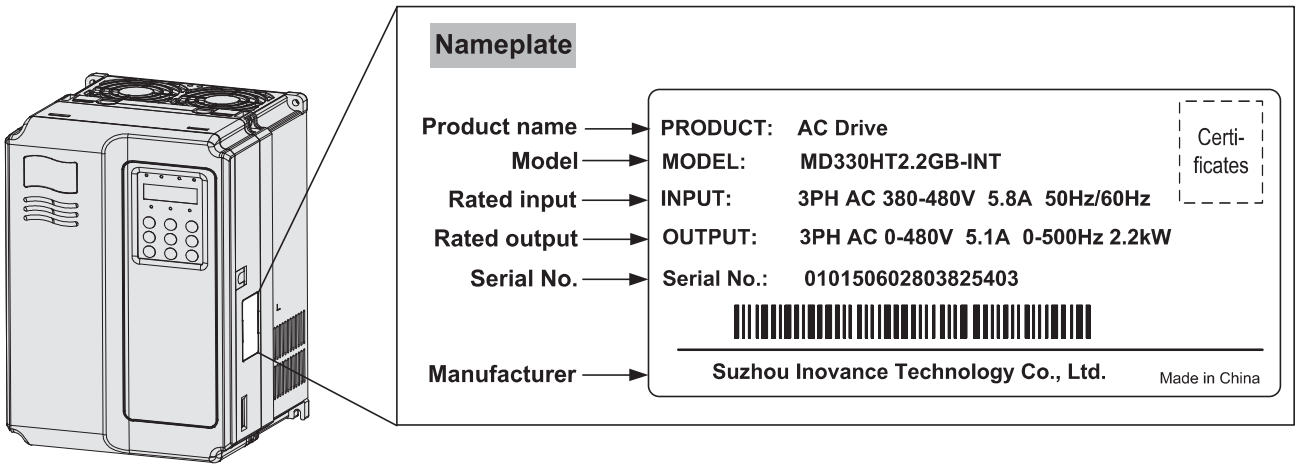
Typical Applications

Coiling/De-coiling

Woven/ Non-Woven Bag Making Machine

Textile Jigger

Name Plate Details



MD330H — Tension control series AC drive

T

Mark	Voltage Class
T	Three-phase 380 to 480 V
S	Single-phase 200 to 240 V

2.2

Mark	0.7		2.2	
Applicable Motor (kW)	0.7		2.2	

G

Mark	Type of Applicable Motor
G	General type

B

Mark	Customized
B	With braking unit
Blank	Standard

-INT

Mark	Version
-INT	International
-(a)	Other variants

Note (a): The model number may include a suffix "XXXXXXXXXX", Where "XXXXXXXXXX" can be blank or combination of any alphanumeric and/or symbols that represents customer identity.

Specification

Voltage class		Single-phase 220 VAC				Three-phase 380 VAC							
Model: MD330HxxxG(B)*-INT		S0.4	S0.7	S1.5	S2.2	T0.7	T1.5	T2.2	T3.7	T5.5	T7.5	T11	T15
Frame Size		B				B			C		D		
Dimension[(2)]	Height Width Depth	[H] : 186 mm [W] : 125 mm [D] : 164 mm				[H] :186 mm [W] : 125 mm [D] : 164 mm			[H] : 248 mm [W] : 160 mm [D] : 183 mm		[H] : 322 mm [W] : 208 mm [D] : 192 mm		
Drive Input	Rated Input Voltage	Single phase 220V (-15% to +20%)				Three-phase 380V (-15% to +10%)							
	Rated Input Current, [A]	5.4	8.2	14	23	3.4	5	5.8	10.5	14.6	20.5	26	35
	Rated input frequency	50/60 Hz, ê5%											
	Power Capacity, [kVA]	1	1.5	3	4	1.5	3	4	5.9	8.9	11	17	21
Drive Output	Applicable Motor [Kw]	0.4	0.75	1.5	2.2	0.75	1.5	2.2	3.7	5.5	7.5	11	15
	Output Current ,[A]	2.3	4	7	9.6	2.1	3.8	5.1	9	13	17	25	32
	Default carrier frequency (kHz)	6	6	6	6	6	6	6	6	6	6	6	6
	Overload Capacity	150% for 60 Sec											
	Maximum output frequency	50 Hz to 500 Hz											
Braking Resistor	Recommended Power, [kW]	0.08	0.08	0.1	0.1	0.15	0.15	0.25	0.3	0.4	0.5	0.8	1
	Recommended Resistance, minimum [W]	200	150	100	70	300	220	200	130	90	65	43	32
	Thermal design power (kW)	0.016	0.03	0.055	0.072	0.027	0.05	0.066	0.12	0.195	0.262	0.445	0.553
Enclosure		IP20											

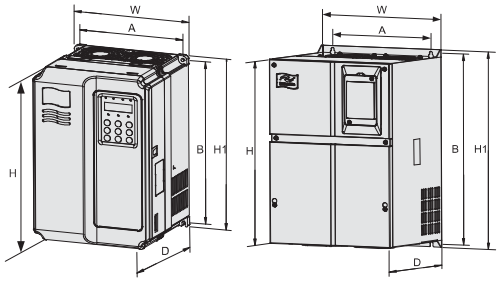
*, “B” denotes build-in brake function.

Specification

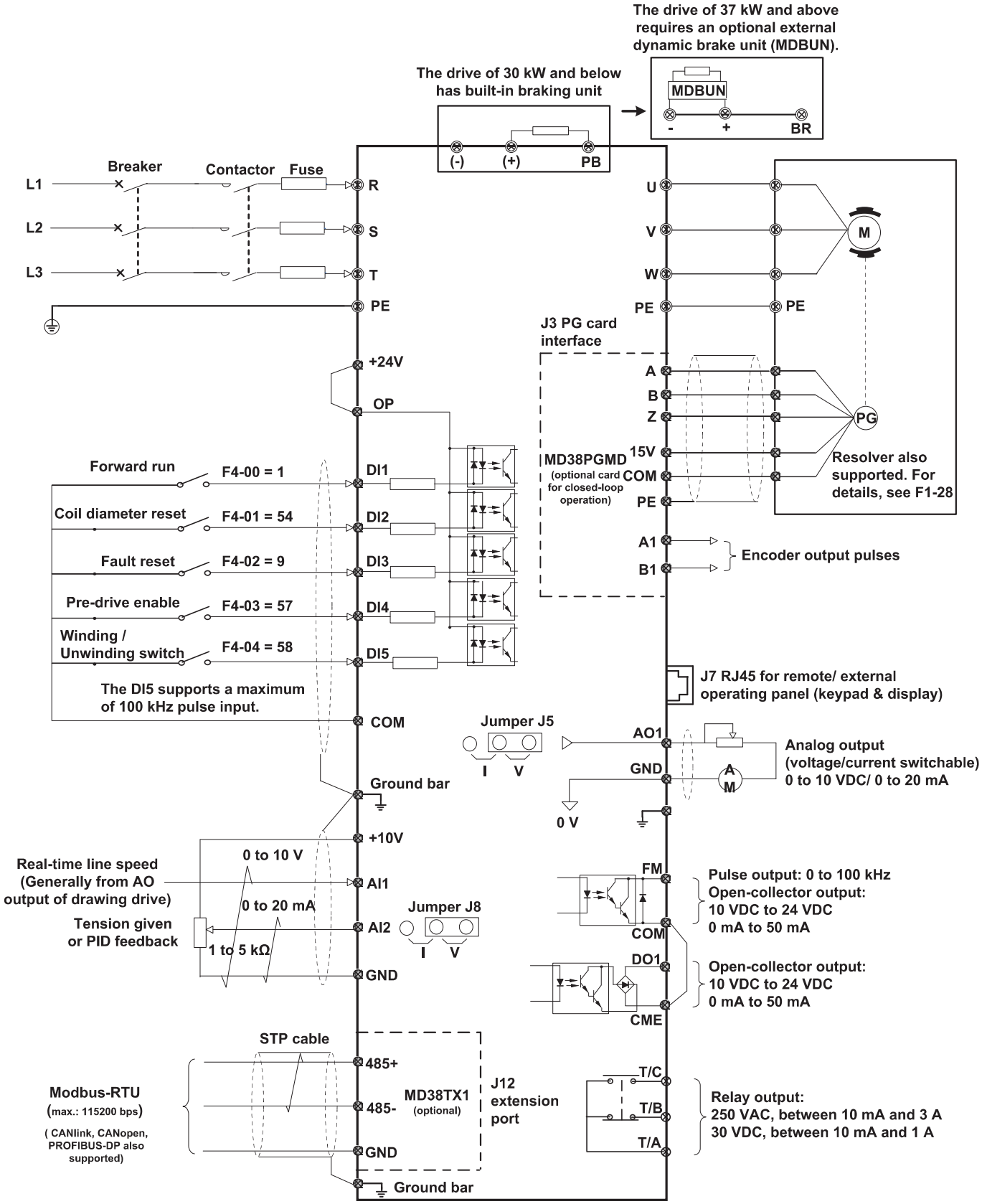
Voltage class		Three-phase 380 VAC									
Model: MD330HxxxG(B)*-INT		T18.5	T22	T30	T37	T45	T55	T75	T90	T110	T132	T160
Frame Size		E			F			G		H		
Dimension[2]	Height Width Depth	[H] : 463 mm [W] : 285 mm [D] : 228 mm			[H] : 600 mm [W] : 385 mm [D] : 265 mm			[H] : 700 mm [W] : 473 mm [D] : 307 mm		[H] :930 mm [W] :579 mm [D] : 380 mm		
Drive Input	Rated Input Voltage	Three-phase 380V (-15% ~ +10%)										
	Rated Input Current, [A]	38.5	46.5	62	76	92	113	157	180	214	256	307
	Rated input frequency	50/60 Hz, ê5% (47.5 to 63 Hz)										
	Power Capacity, [kVA]	24	30	40	57	69	85	114	134	160	192	231
Drive Output	Applicable Motor [Kw]	18.5	22	30	37	45	55	75	90	110	132	160
	Output Current ,[A]	37	45	60	75	91	112	150	176	210	253	304
	Default carrier frequency (kHz)	6	6	6	5	5	4	3	3	3	3	3
	Overload Capacity	150% for 60 Sec										
	Maximum output frequency	50 Hz to 500 Hz										
Braking Resistor	Recommended Power, [kW]	1.3	1.5	2.5	3.7	4.5	5.5	7.5	9	5.5 x 2	6.5 x 2	8 x 2
	Recommended Resistance, minimum [W]	25	22	16	13.3	13.3	10	6.7	6.7	10 x 2	6.7 x 2	6.7 x 2
Thermal design power (kW)		0.651	0.807	1.01	1.2	1.51	1.8	1.84	2.08	2.55	3.06	3.61
Enclosure		IP20										

*, “B” denotes build-in brake function.

Dimensions



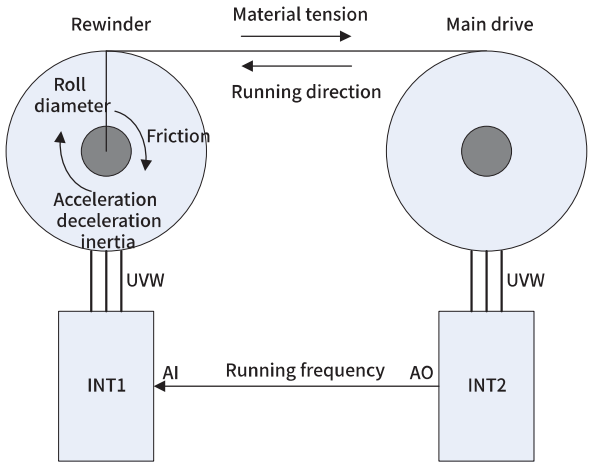
Typical System Connection Diagram



Open-loop Torque Control

Features:

- Without pendulum (dancer roll) or tension sensor;
- Open loop tension control, suitable for situations with lower tension control accuracy.

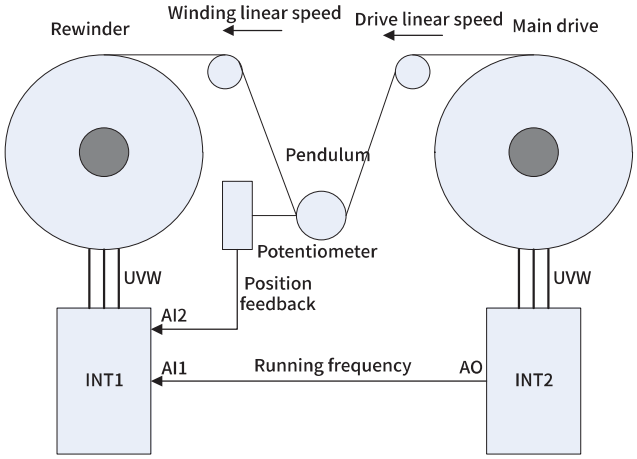


Winding diameter is calculated based on linear speed in open-loop tension torque control. The output torque is calculated according to the material tension. Perform friction torque and inertia torque compensation during acceleration/deceleration according to the actual situation of the system.

Closed-loop Speed Control

Features:

- Material tension feedback from pendulum (dancer roll) or tension sensor
- Constant pendulum position or constant tension control through closed-loop adjustment of AC drive output frequency
- To realize closed-loop speed control through synchronous frequency reference (related to linear speed) in cooperation with speed closed-loop adjustment, suitable to situations with speed adjus tment margin (pendulum or elastic material available)



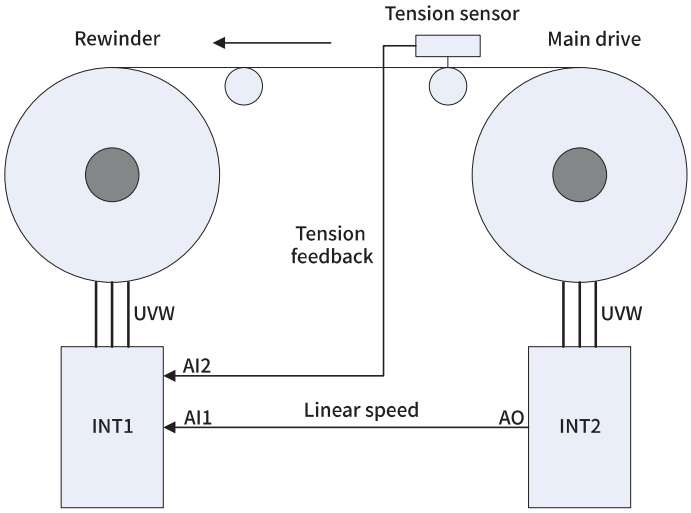
Two AI channels respectively receive the signal from the pendulum position potentiometer and the running frequency signal from the main drive. The winding diameter is calculated based on linear speed. Synchronous

frequency is determined by the linear speed and the winding diameter. Output frequency is determined by synchronous frequency and pendulum position feedback closed-loop adjustment.
Compared with the “main frequency + PID” control method of the general purpose AC drive, the main frequency reference of MD330H which can follow the change of the linear speed is more accurate due to involvement of winding diameter calculation, making pendulum position control more stable.

Closed-loop Torque Control

Features:

- Material tension from tension sensor
- Closed-loop adjustment of the AC drive output torque to achieve constant tension control
- Open loop torque control integrated, to realize closed-loop torque control through open-loop tension calculation in cooperation with tension closed-loop adjustment.
- High tension control accuracy, suitable to situations where rigid material is used or there is no speed adjustment margin

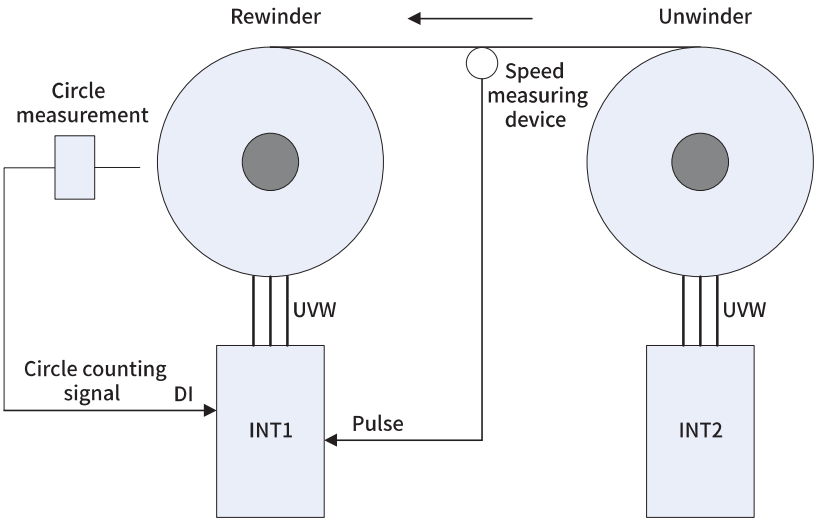


Two AIs respectively receive the signal from the pendulum position potentiometer and the running frequency signal from the main drive. This mode provides the tension reference with open-loop control and implements closed-loop adjustment with the tension sensor. The winding diameter calculation is reserved and setting of the inertia and the friction torque compensation is not required due to closed-loop adjustment (you can also set the inertia and the friction torque compensation to optimize the response speed).
Users can also use closed loop speed control in situation where the tension sensor is used for elastic material (with speed adjustment margin) to avoid elastic oscillation.

Constant Linear Speed Control

Features:

- Suitable to the situation where main drive is not available and either of the rewinder or unwinder works as the main drive in constant linear speed.



- Rewinder working as the main drive
  The winding diameter must be got to keep the material running in constant linear speed. Two ways of getting the winding diameter are shown in the preceding figure:
- Calculate the winding diameter by using thickness accumulation method based on the DI circle counting signal.
- Install an additional speed measuring device and send pulse signals to the AC drive. Calculate the winding diameter by using linear speed method to realize closed-loop speed control through.
  You can choose either way or other applicable ways.
  Frequency is calculated based on linear speed and winding diameter to realize constant linear speed running without main drive.
  Select any one of the three control modes for the unwinder (section 6.1.1 to chapter 6.1.3) according to the actual situation.

  Note: The preceding four typical applications are only for the description of four applicable tension control occasions. Users can use any other application according to the actual situation.

automation by INOVANCE

India
Inova Automation Pvt . Ltd .
No. 11, Bethal Nagar, Seevaram, Perungudi, Chennai – 600906 Tel : +91 (0) 44 43800201
Sales office Ahmedabad Tel : (91) 79 4003 4272
Delhi, Mumbai, Kolakata, Pune, Benagaluru, Coimbatore, Hyderabad
Info.inovaindia@inova-automation.com

South Korea
Inova Automation Korea
Tel : (82) 10 74285732
info@inova-automation.com

Germany - Stuttgart
Inovance Technology Europe GmbH
Tel : (49) 7144 899 0s
ales@powerautomation.com

FRANCE - Bordeaux
Inovance Technology Europe GmbH
Tel : (33) 559 4010 50
Pa.france@powerautomation.com

ITALY – Milano
Inova Automation Italy Sri
Tel : (39) 02 26822318
info@inova-automation.it

Hong Kong Sar (Export Office)
Inova Automation Co., Ltd .
International Export Office
Tel : (852) 275106080
info@inova-automation.com

Iran – Teheran
Inova Automation (Parsian)
Tel : (98) 21 88600501/2
Info.iran@inova-automation.com

Turkey- Istanbul
Inova Automation Co., Ltd. Turkey
Tel : (90) 216 706 1789
Info.turkry@inova-automation.com

Copyright : Inova Automation Co., Ltd 2019. All rights reserved.