

# BUREAU OF INDIAN STANDARDS

## Program of Work

### PGD 18 : Industrial Automation Systems And Robotics

**Scope:** a) Standardization in the field of industrial automation systems and integration concerning discrete part manufacturing and encompassing the application of multiple technologies i.e. information systems, machines, equipment communication (Bus communication, telecommunication etc. excluded): - Process automation; - Electrical electronics equipment; - Programmable logical controllers for general application; - Sensors. b) Standardization in the field of Robotics.

**Liaison:** **ISO TC-184 (P): Automation systems and integration ISO TC-184 SC-1 (P): Industrial cyber and physical device control ISO TC-184 SC-4 (P): Industrial data ISO TC-184 SC-5 (P): Interoperability, integration, and architectures for enterprise systems and automation applications ISO TC-299 (P): Robotics**

## Published Standards

S.No	IS No.	TITLE	Reaffirm M-Y	No. of Amds	Eqv.
1	IS/ISO 10218-1:2025 ISO 10218-1 : 2025 ISO 10218-1 : 2025	Robotics safety requirements: Part 1 Industrial robots		-	Identical under single numbering
2	IS/ISO 10218-2:2025 ISO 10218-2 : 2025 ISO 10218-2 : 2025	Robotics safety requirements: Part 2 Industrial robot applications and robot cells		-	Identical under single numbering
3	IS/ISO 10303-1:2021 ISO 10303-1 : 2021 ISO 10303-1 : 2021	Industrial automation systems and integration -- Product data representation and exchange: Part 1 Overview and fundamental principles		-	Identical under single numbering
4	IS 13450 (Part 4/Sec 1):2020 IEC TR 60601-4-1 : 2017 Reviewed In : 2025 IEC 60601-4-1:2017	Medical electrical equipment: Part 4 Guidance and interpretation: Section 1 Medical electrical equipment and medical electrical systems employing a degree of autonomy	March, 2025	-	Identical under dual numbering
5	IS 13547 (Part 1):2010 Reviewed In : 2025 Decision taken to Reaffirm and Archive ISO 9409-1 : 2004	Manipulating industrial robots -- Mechanical interfaces: Part 1 Plates (second revision)	July, 2025	-	Identical under dual numbering
6	IS 13547 (Part 2):2010	Manipulating industrial robots -- Mechanical interfaces: Part 2	July, 2025	-	Identical under dual numbering

	Reviewed In : 2025 Decision taken to Reaffirm and Archive ISO 9409-2 : 2002	Shafts (first revision)			
7	IS/ISO 13584-1:2001 ISO 13584-1 : 2001 Reviewed In : 2021 ISO 13584 : Part 1 : 2001	Industrial automation systems and integration -- Parts library: Part 1 Overview and fundamental principles	January, 2021	-	Identical under single numbering
8	IS 14530 (Part 1):2019 ISO 10218-1 : 2011 ISO 10218-1 : 2011	Robots and robotic devices -- Safety requirements for industrial robots: Part 1 Robots (first revision)		-	Identical under dual numbering
9	IS 14530 (Part 2):2019 ISO 10218-2 : 2011 ISO 10218-2 : 2011	Robots and robotic devices -- Safety requirements for industrial robots: Part 2 Robot systems and integration (first revision)		-	Identical under dual numbering
10	IS 14531:2005 ISO 9946 Reviewed In : 2025 Decision taken to Reaffirm and Archive ISO 9946 : 1999	Manipulating industrial robots -- Presentation of characteristics (first revision)	March, 2025	-	Identical under dual numbering
11	IS 14533:2005 ISO 9283 Reviewed In : 2025 Decision taken to Reaffirm and Archive ISO 9283 : 1998	Manipulating industrial robots -- Performance criteria and related test methods (first revision)	March, 2025	-	Identical under dual numbering
12	IS 14662:2024 ISO 8373 : 2021 ISO 8373 : 2021	Robotics Vocabulary		-	Identical under dual numbering
13	IS 14663:2018 ISO 9787 : 2013 Reviewed In : 2023 ISO 9787 : 1990	Robots and robotic devices -- Coordinate systems and motion nomenclatures (first revision)	January, 2023	-	Identical under dual numbering
14	IS 14776 (Part 1):2000 ISO/TR 10314-1 Reviewed In : 2025 Decision taken to Reaffirm and Archive ISO/TR 10314-1 : 1990	Industrial automation -- Shop floor production: Part 1 Reference model for standardization and a methodology for identification of requirements	March, 2025	-	Identical under dual numbering
15	IS 14776 (Part 2):2000 ISO/TR 10314-2 Reviewed In : 2025 Decision taken to Reaffirm and Archive ISO/TR 10314-2 : 1991	Industrial automation -- Shop floor production: Part 2 Application of the reference model for standardization and methodology	March, 2025	-	Identical under dual numbering
16	IS 15034:2001 ISO/TR 13309 Reviewed In : 2023	Manipulating industrial robots -- Informative guide on test equipment and metrology methods	January, 2023	-	Identical under dual numbering

	ISO-R 13309:1995	of operation for robot performance evaluation in accordance with is 14533:1998			
17	IS 15291:2024 ISO 11593 : 2022 ISO 11593 : 2022	Robots for industrial environments -- Automatic end effector exchange systems -- Vocabulary (first revision)		-	Identical under dual numbering
18	IS 15296:2017 ISO 11161 Reviewed In : 2022 ISO 11161	Safety of machinery -- Integrated manufacturing systems -- Basic requirements (first revision)	January, 2022	-	Identical under dual numbering
19	IS/ISO 15531-1:2004 ISO 15531-1 : 2004 Reviewed In : 2023 ISO 15531-1 : 2004	Industrial automation systems and integration -- Industrial manufacturing management data: Part 1 General overview	January, 2023	-	Identical under dual numbering
20	IS/ISO 15531-31:2004 ISO 15531-31 : 2004 Reviewed In : 2023 IS 15531 : Part 31 : 2004	Industrial automation systems and integration -- Industrial manufacturing management data: Part 31 Resource information model	January, 2023	-	Identical under single numbering
21	IS/ISO 15531-32:2005 ISO 15531-32 : 2005 Reviewed In : 2023 ISO 15531 : Part 32 : 2005	Industrial automation systems and integration - Industrial manufacturing management data : resources usage management: Part 32 conceptual model for resources usage management data	January, 2023	-	Identical under single numbering
22	IS/ISO 15531-42:2005 ISO 15531-42 : 2005 Reviewed In : 2023 ISO 15531 : Part 42 : 2005	Industrial automation systems and integration - Industrial manufacturing management data: Part 42 time model	January, 2023	-	Identical under single numbering
23	IS/ISO 15531-43:2006 ISO 15531-43 : 2006 Reviewed In : 2023 ISO 15531 : Part 43 : 2006	Industrial Automation Systems and Integration Industrial Manufacturing Management Data Part 43 Manufacturing Flow Management Data : Data Model for Flow Monitoring and Manufacturing Data Exchange	January, 2023	-	Identical under single numbering
24	IS 15571:2005 ISO/TR 11065 Reviewed In : 2023 ISO/TR 11065 : 1992	Industrial automation glossary	January, 2023	-	Identical under dual numbering
25	IS 16492:2017 ISO 14539 : 2000 Reviewed In : 2025 ISO 14539 : 2000	Manipulating industrial robots - Object handling with grasp - Type grippers - Vocabulary and presentation of characteristics	July, 2025	-	Identical under dual numbering
26	IS 16530 (Part 1):2016 ISO 16100-1 : 2009 Reviewed In : 2025 ISO 16100-1 : 2009	Industrial automation systems and integration - Manufacturing software capability profiling for interoperability: Part 1 framework	July, 2025	-	Identical under dual numbering
27	IS 16530 (Part 2):2016 ISO 16100 - 2 :2003 Reviewed In : 2025	Industrial automation systems and integration - Manufacturing software capability profiling for interoperability part 2 profiling	July, 2025	-	Identical under dual numbering

	ISO 16100-2 : 2003	methodology			
28	IS 16530 (Part 3):2017 ISO 16100-3 : 2005 Reviewed In : 2025 ISO 16100-3 : 2005	Industrial automation systems and integration - Manufacturing software capability profiling for interoperability: Part 3 interface services, protocols and capability templates	July, 2025	-	Identical under dual numbering
29	IS 16530 (Part 4):2016 ISO 16100 4 : 2006 Reviewed In : 2025 ISO 16100-4 : 2006	Industrial automation systems and integration - Manufacturing software capability profiling for interoperability: Part 4 conformance test methods, criteria and reports	July, 2025	-	Identical under dual numbering
30	IS 16608:2018 ISO 13482 Reviewed In : 2024 ISO 13482 : 2014	Robots and robotic devices - Safety requirements for personal care robots	March, 2024	-	Identical under dual numbering
31	IS 17192 (Part 1):2019 ISO 18646-1 : 2016 Reviewed In : 2023 ISO 18646-1	Robotics â€” Performance Criteria and Related Test Methods for Service Robots Part 1 Locomotion for Wheeled Robots	August, 2023	-	Identical under dual numbering
32	IS 17192 (Part 2):2024 ISO 18646-2 : 2024 ISO 18646-2 : 2024	Robotics Performance criteria and related test methods for service robots Part 2: Navigation (first revision)		-	Identical under dual numbering
33	IS 17192 (Part 4):2023 ISO 18646-4 : 2021 ISO 18646-4 : 2021	Robotics Performance criteria and related test methods for service robots Part 4: Lower-back support robots		-	Identical under dual numbering
34	IS 17193:2019 ISO/TS 15066 ; 2016 Reviewed In : 2023 ISO/TS 15066 : 2016	Robots and Robotic Devices â€” Collaborative Robots	August, 2023	-	Identical under dual numbering
35	IS 17437:2020 ISO 19649 : 2017 Reviewed In : 2025 ISO 19649:2017	Mobile Robots â€” Vocabulary	March, 2025	-	Identical under single numbering
36	IS 17691 (Part 2):2021 ISO/TR 20218-2:2017 ISO/TR 20218-2:2017	ROBOTICS SAFETY DESIGN FOR INDUSTRIAL ROBOT SYSTEMS PART 2: MANUAL LOADUNLOAD STATIONS		-	Identical under single numbering
37	IS 17691 (Part 1):2021 ISO/TR 20218-1:2018 ISO/TR 20218-1:2018	ROBOTICS SAFETY DESIGN FOR INDUSTRIAL ROBOT SYSTEMS PART 1: END-EFFECTORS		-	Identical under single numbering
38	IS 17885 (Part 1):2022 ISO 23247-1 : 2021 ISO 23247-1 : 2021	Automation systems and integration Digital twin framework for manufacturing Part 1: Overview and general principles		-	Identical under dual numbering
39	IS 17885 (Part 2):2022 ISO 23247-2 : 2021	Automation systems and integration Digital twin framework for manufacturing Part 2:		-	Identical under dual numbering

	ISO 23247-2 : 2021	Reference architecture			
40	IS 17885 (Part 3):2022 ISO 23247-3 : 2021 ISO 23247-3 : 2021	Automation systems and integration Digital twin framework for manufacturing Part 3: Digital representation of manufacturing elements		-	Identical under dual numbering
41	IS 17885 (Part 4):2022 ISO 23247-4 : 2021 ISO 23247-4 : 2021	Automation systems and integration Digital twin framework for manufacturing Part 4 : Information exchange		-	Identical under dual numbering
42	IS/ISO 20140-1:2019 ISO 20140-1 : 2019 Reviewed In : 2025 ISO 20140-1 : 2019	Automation systems and integration Evaluating energy efficiency and other factors of manufacturing systems that influence the environment Part 1: Overview and general principles	March, 2025	-	Identical under single numbering
43	IS/ISO 20140-2:2018 ISO 20140-2 : 2018 Reviewed In : 2023 ISO 20140-2 : 2018	Automation systems and integration Evaluating energy efficiency and other factors of manufacturing systems that influence the environment Part 2: Environmental performance evaluation process	May, 2023	-	Identical under single numbering
44	IS/ISO 20140-3:2019 ISO 20140 - 3 : 2019 Reviewed In : 2025 ISO 20140 - 3 : 2019	Automation systems and integration Evaluating energy efficiency and other factors of manufacturing systems that influence the environment Part 3: Environmental performance evaluation data aggregation process	March, 2025	-	Identical under single numbering
45	IS/ISO 20140-5:2017 ISO 20140-5 : 2017 Reviewed In : 2023 ISO 20140-5 : 2017	Automation systems and integration Evaluating energy efficiency and other factors of manufacturing systems that influence the environment Part 5: Environmental performance evaluation data	May, 2023	-	Identical under single numbering
46	IS/ISO 20242-1:2005 ISO 20242-1 : 2005 Reviewed In : 2022 ISO 20242-1 : 2005	Industrial automation systems and integration - Service interface for testing applications: Part 1 overview	November, 2022	-	Identical under single numbering
47	IS/ISO 8000-65:2020 ISO 8000-65 : 2020 ISO 8000-65 : 2020	Data Quality Part 65: Data quality management: Process measurement questionnaire		-	Identical under single numbering
48	IS/ISO 8000-110:2021 ISO 8000-110 : 2021 ISO 8000-110 : 2021	Data Quality Part 110: Master data: Exchange of characteristic data: Syntax semantic encoding and conformance to data specification		-	Identical under single numbering
49	IS/ISO 8000-1:2022 ISO 8000-1 : 2022 ISO 8000-1 : 2022	Data Quality Part 1: Overview		-	Identical under single numbering
50	IS/ISO 8000-2:2022 ISO 8000-2 : 2022 ISO 8000-2 : 2022	Data Quality Part 2: Vocabulary		-	Identical under single numbering
51	IS/ISO 8000-8:2015 8000-8 : 2015	Data Quality Part 8: Information and data quality: Concepts and		-	Identical under single numbering

	8000-8 : 2015	measuring			
52	IS/ISO/TS 8000-60:2017 ISO 8000-60 : 2017 ISO 8000-60 : 2017	Data Quality Part 60: Data quality management: Overview		-	Identical under single numbering
53	IS/ISO 8000-61:2016 ISO 8000-61 : 2016 ISO 8000-61 : 2016	Data Quality Part 61: Data quality management: Process reference model		-	Identical under single numbering
54	IS/ISO 8000-62:2018 ISO 8000-62 : 2022 ISO 8000-62 : 2022	Data Quality Part 62: Data quality management: Organizational process maturity assessment: Application of standards relating to process assessment		-	Identical under single numbering
55	IS/ISO 8000-63:2019 ISO 8000-63 : 2019 ISO 8000-63 : 2019	Data Quality Part 63: Data quality management: Process measurement		-	Identical under single numbering
56	IS/ISO 8000-64:2022 ISO 8000-64 : 2022 ISO 8000-64 : 2022	Data Quality Part 64: Data quality management: Organizational process maturity assessment: Application of the Test Process Improvement method		-	Identical under single numbering
57	IS/ISO 8000-66:2021 ISO 8000-66 : 2021 ISO 8000-66 : 2021	Data Quality Part 66: Data quality management: Assessment indicators for data processing in manufacturing operations		-	Identical under single numbering
58	IS/ISO/TS 8000-81:2021 ISO 8000-81 : 2021 ISO 8000-81 : 2021	Data Quality Part 81: Data quality assessment: Profiling		-	Identical under single numbering
59	IS/ISO/TS 8000-82:2022 ISO 8000-82 : 2022 ISO 8000-82 : 2022	Data Quality Part 82: Data quality assessment: Creating data rules		-	Identical under single numbering
60	IS/ISO 8000-100:2016 ISO 8000-100 : 2016 ISO 8000-100 : 2016	Data Quality Part 100: Master data: Exchange of characteristic data: Overview		-	Identical under single numbering
61	IS/ISO 8000-115:2018 ISO 8000-115 : 2018 ISO 8000-115 : 2018	Data Quality Part 115: Master data: Exchange of quality identifiers: Syntactic semantic and resolution requirements		-	Identical under single numbering
62	IS/ISO 8000-116:2019 ISO 8000-116 : 2019 ISO 8000-116 : 2019	Data Quality Part 116: Master data: Exchange of quality identifiers: Application of ISISO 8000-115 to authoritative legal entity identifiers		-	Identical under single numbering
63	IS/ISO 8000-120:2016 ISO 8000-120 : 2016 ISO 8000-120 : 2016	Data Quality Part 120: Master data: Exchange of characteristic data: Provenance		-	Identical under single numbering
64	IS/ISO 8000-130:2016 ISO 8000-130 : 2016 ISO 8000-130 : 2016	Data Quality Part 130: Master data: Exchange of characteristic data: Accuracy		-	Identical under single numbering



	2016				
65	IS/ISO 8000-140:2016 ISO 8000-140 ISO 8000-140	Data Quality: Part 140 Master data: Exchange of characteristic data: Completeness		-	Identical under single numbering
66	IS/ISO 8000-150:2022 ISO 8000-150 ISO 8000-150	Data Quality Part 150: Data quality management: Roles and responsibilities		-	Identical under single numbering
67	IS/ISO 8000-311:2012 ISO 8000-311 : 2012 ISO 8000-311 : 2012	Data Quality Part 311: Application of Product Data Quality for Shape (PDQ-S) i <sub>g</sub> ½ Guidance		-	Identical under single numbering

### Standards under Development

#### Projects Approved

SI. No.	Doc No.	Title
1	PGD 18 (28870)	Exoskeleton Load-Bearing Robots - Vocabulary
2	PGD 18 (28873)	Domestic Floor Cleaning Robots
3	PGD 18 (28874)	Commercial Floor Cleaning Robots
4	PGD 18 (28875)	Automated Road Cleaning Systems
5	PGD 18 (28880)	Composite materials for light weight robots with bullet proof capabilities

#### Preliminary Draft Standards

SI. No.	Doc No.	Title
No Records Found		

#### Drafts Standards in WC Stage

SI. No.	Doc No.	Title
1	PGD 18 (28816)	Robotics Test Methods for Measuring the Energy Consumption of Robots 6-Axis Articulated Industrial Robots
2	PGD 18 (28877)	Robotics Safety Requirements for Industrial Mobile Robots Part 1 Industrial Mobile Robots

#### Draft Standards Completed WC Stage

SI. No.	Doc No.	Title
No Records Found		

#### Finalized Draft Indian Standard

SI. No.	Doc No.	Title
1	PGD 18 (28338) Amendment of: IS/ISO 20140:2017	Automation Systems and Integration Evaluating Energy Efficiency and other Factors of Manufacturing Systems that Influence the Environment Part 5 Environmental Performance Evaluation Data First Revision
2	PGD 18 (28339) Amendment of: IS 15296:2017	Safety of machinery Integration of machinery into a system Basic requirements Second Revision
3	PGD 18 (28352) Amendment of: IS/ISO 8000:2018	Data quality Part 115 Master Data -- Exchange of quality identifiers -- Syntactic semantic and resolution requirements first revision
4	PGD 18 (28804)	Automation Systems and Integration Nuclear Digital Ecosystem Part 1 Overview and Framework

## Finalized Draft Indian Standards under Print

Sl. No.	Doc No.	Title
1	PGD 18 (28337)	Robotics Test methods for exoskeleton-type walking RACA robot
2	PGD 18 (28353) <b>Amendment of: IS/ISO 10303:2021</b>	Industrial automation systems and integration -- Product data representation and exchange Part 1 Overview and fundamental principles second revision
3	PGD 18 (28879)	Robotics Performance Criteria and Related Test Methods for Service Robots Part 3 Manipulation
4	PGD 18 (33335)	Robotics Performance Criteria and Related Test Methods for Service Robots Part 5 Locomotion for legged robots
5	PGD 18 (33390)	Robotics Performance Criteria and Related Test Methods for Service Robots Part 6 Lower-Limb Wearable Robots
6	PGD 18 (33392)	Automation Systems And Integration Model-Based Standards Authoring
7	PGD 18 (33470)	Medical Electrical Equipment Part 2-77 Particular Requirements for the Basic Safety and Essential Performance of robotically Assisted Surgical Equipment
8	PGD 18 (33473)	Medical Electrical Equipment Part 2 Particular Requirements for Basic Safety and Essential Performance Section 78 Medical Robots for Rehabilitation Assessment Compensation or Alleviation

**Total Published Standards:46 Total Standards Under development:19**

### Aspect Wise Report

Product : 2  
 Code of Practices : 23  
 Methods of Test : 21  
 Terminology : 10  
 Dimensions : 0  
 System Standard : 0  
 Safety Standard : 9  
 Others : 2  
 Service Specification : 0  
 Process Specification : 0  
 Unclassified : 0

### Annexure-I :List of Indian Standards Withdrawn/Superseded

Sl. No.	IS No. & Year	Title
1	IS 14530:1998 ISO 10210 <b>Reviewed In : 2018 ISO 10218 : 1992</b>	Manipulating industrial robots - Safety
2	IS 15031:2001 ISO/TR 11032 <b>Reviewed In : 2018 ISO/TR 11032 : 1994</b>	Manipulating industrial robots - Application oriented test - Spot welding
3	IS 15032 (Part 1):2001 ISO 6210-1 <b>Reviewed In : 2018 ISO 6210-1 : 1991</b>	Cylinders for robot resistance welding guns Part 1 general requirements
4	IS 15033:2001 ISO/TR 11062 <b>Reviewed In : 2018 ISO~R 11062:1994</b>	Manipulating industrial robots - Emc test methods and performance evaluation criteria - Guidelines
5	IS 15035:2001 ISO/TR 10562 <b>Reviewed In : 2012</b>	Manipulating Industrial Robots - Intermediate Code for Robots ICR
6	IS 15292:2003 ISO 15187 : 2000	Manipulating industrial robots -- Graphical user interfaces for programming and operation of robots GUI-R



	Reviewed In : 2013 ISO 15187:2000	
7	IS 15294:2003 ISO/TR 10450 Reviewed In : 2013	Industrial Automation Systems and Integration - Operating Conditions for Discrete Part Manufacturing - Equipment in Industrial Environments
8	IS 15295:2003 ISO 10656 Reviewed In : 2018 ISO 10656 : 1996	Electric resistance welding - Integrated transformers for welding guns
9	IS 16606:2017 ISO 11593 : 1996 ISO 11593 : 1996	Manipulating industrial robots - Automatic end effector exchange systems - Vocabulary and presentation of characteristics

#### Annexure-II :List of Indian Product Standards

Sl. No.	IS No. & Year	Title
1	IS 13547 (Part 1):2010 Reviewed In : 2025 Decision taken to Reaffirm and Archive ISO 9409-1 : 2004	Manipulating industrial robots -- Mechanical interfaces Part 1 Plates second revision
2	IS 13547 (Part 2):2010 Reviewed In : 2025 Decision taken to Reaffirm and Archive ISO 9409-2 : 2002	Manipulating industrial robots -- Mechanical interfaces Part 2 Shafts first revision