newsTRAC

NEWSLETTER FOR TECHNICIANS IN REFRIGERATION AND AIRCONDITIONING (RAC) SECTOR

ISSUE 4 | JANUARY 2019

Inside...

Foreword

TOOLS AND TRAININGS
Guide on various trainings available in India

GOOD SERVICE PRACTICE GUIDE
Split AC installation

FROM THE FIELD

Interview
Shafi Wakeel – a Mumbai based technician

Handy Guides

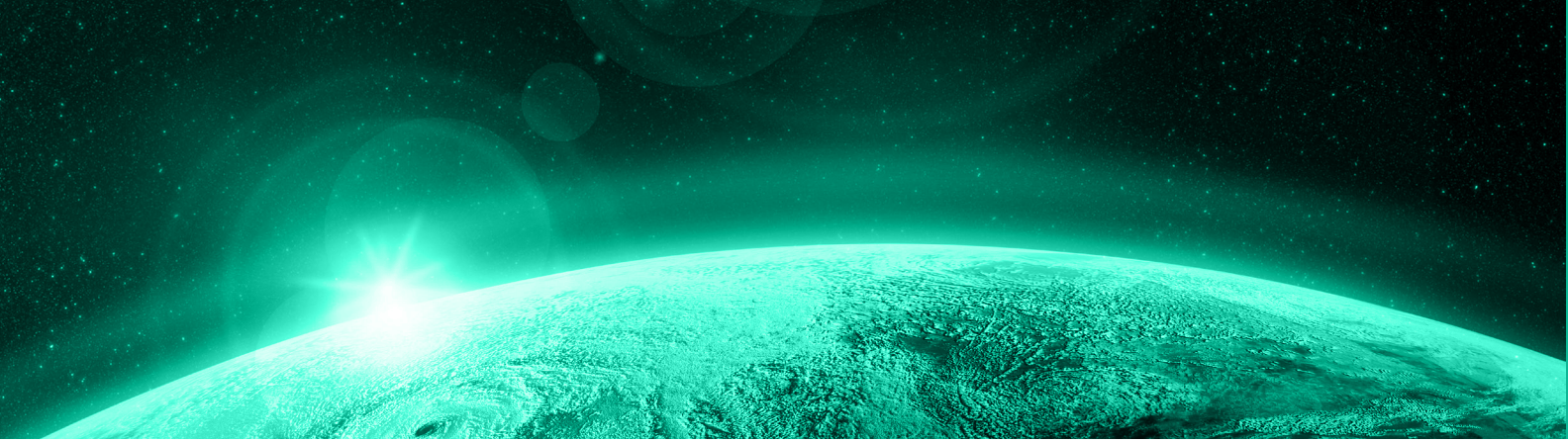
PAINTING-I-PRIZE-Mr. Yash Garg 24th World Ozone Day- 2018

Ministry of Environment, Forest & Climate Change
Government of India

UN environment
United Nations Environment Programme

giz

teri
The Energy and Resources Institute
Creating Innovative Solutions for a Sustainable Future



Foreword

On World Ozone Day 2018, the Hon'ble Union Minister for Environment, Forest and Climate Change, Dr. Harsh Vardhan, released a draft India Cooling Action Plan (ICAP), which addresses the cooling requirement of the country across sectors for the coming 20 years. India is the first country to bring out a National Cooling Action Plan globally. The draft ICAP lists out synergistic actions towards securing environment as well as socio-economic benefits for the society. The draft ICAP emphasizes the importance of skilled service technicians in the room air conditioning sector. Training of service technicians on good servicing practices reduces the refrigerant consumption and also provides better employment opportunities. Under HCFC Phase out Management Plan (HPMP) Stage I, 11,276 technicians have already been trained and 17,000 technicians will be trained under HPMP Stage II till 2023.

To strengthen and augment the training of Refrigeration and Air-Conditioning (RAC) service technicians in the country, the Ministry of Environment, Forest and Climate Change, Government of India, has signed a Memorandum of Understanding with the Ministry of Skill Development and Entrepreneurship, Government of India, to jointly undertake ambitious training and certification of 1,00,000 room AC servicing technicians on good servicing practices and alternative refrigerants to ozone depleting substances, under the Pradhan Mantri Kaushal Vikas Yojana. The skilling of RAC service technicians shall provide twin benefits of environmental protection and livelihood enhancement of RAC Service Technicians.

The latest edition of the newsTRAC covers the challenges faced by servicing technicians in the field, and underscores the need for adoption of good service practices by the technicians. This issue includes a Refrigerant chart containing Global Warming Potential (GWP), Ozone Depletion Potential (ODP), flammability, etc. of refrigerants. A separate chart on pressure-temperature settings for in-use refrigerants is also provided. These charts are given as separate tear-on pages which could be used as a reference by the service technicians during their day to day job.

I congratulate The Energy and Resources Institute, GIZ and the United Nations Environment Programme for bringing out the fourth issue of this newsletter.

My best wishes to all NewsTRAC readers.

Geeta Menon
Joint Secretary
Ministry of Environment, Forest & Climate Change

Training programmes for Service Technicians

Energy-efficient, ozone- and climate-friendly 'green cooling' is urgently needed worldwide. Most of the refrigerants used in servicing are ozone depleting and/or have high global warming potential. Use of proper servicing techniques that prevent refrigerant leakage and venting out of refrigerants is extremely important for protecting the ozone layer and mitigating the climate impact of refrigerants. While technicians may learn the basics of refrigeration and air-conditioner servicing either on the job, or through a diploma, it is very important for technicians to also learn the good servicing practices associated with environment and climate friendly servicing.

In this issue, the tools and training section includes the details of various kinds of training available for technicians in the refrigeration and air conditioning sector in India. Institutions such as GIZ, Indian Society of Heating, Refrigerating and Air Conditioning Engineers (ISHRAE), and Electronics Sector Skill Council of India (ESSCI) have shared information about their training modules.

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

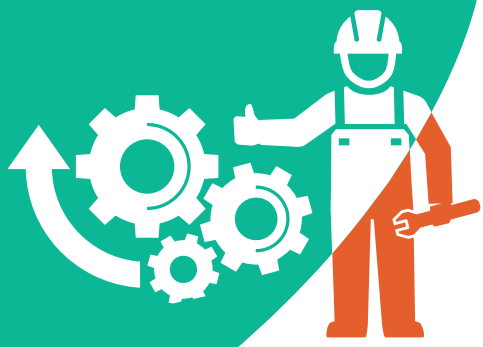
The subjects covered under the training include:

- The principles of air-conditioning
- Alternative refrigerants to HCFC-22
- Copper tube processing
- Good service practices for room air-conditioners and safety
- Good service practices for energy efficient operation of room air-conditioners
- Quality installation of split air-conditioners
- Introduction to certification for RAC service technicians

The GIZ training introduces the technicians to the requirement of certification. This facilitates them to appear for the tests that are conducted by other certifying authorities. In order to register for the training, technicians must contact their training partner. They can also visit http://www.ozonecell.in/ for more information on the training.

Indian Society of Heating, Refrigerating and Air Conditioning Engineers (ISHRAE)

ISHRAE is a technical society of heating, refrigerating and air conditioning professionals. It has more than 12,000 members and 10,000 student-members. ISHRAE conducts the following training programmes: -



1: **Skill Development Programme** – This is a technical refresher training programme on unitary products and systems for practicing AC technicians. This programme is designed for experienced service technicians, AC installers, mechanics, and plant operators. This programme is undertaken as a part of corporate training. Companies, organisations, or a group of individuals (minimum 30) can contact ISHRAE to organise this training. ISHRAE's respective chapter organises the training in the same city where the technicians/corporate houses are based.

A standardised curriculum with 13 subjects is followed in this two-day training. The fee structure is:

- For Corporates: Rs 35000+GST per programme (upto 30 delegates)

- For Chapter-run Programme: Rs 1500+GST per delegate subject to minimum 30 delegates.

For more information, write to Info@ishraehq.in

2: **ISHRAE Certified Professional AC Service Level – 1**: This four-day training programme is designed for junior and senior service technicians, AC installers, mechanics, and plant operators preferably with minimum ITI or equivalent qualification in RAC systems. The certification is valid for five years.

The course consists of two modules at the end of which a test is conducted. Certificate of accomplishment is issued to those candidates who attend the two modules and pass the test. Those who do not clear the exam are given a chance to retake the test after paying a fee of Rs 750. Candidates can take the level - 2 certification after completing level 1. The delegate fee for the course is Rs. 4000 +18% GST for ISHRAE members, and Rs. 5000+GST for non-members.

Admission is on first come, first serve basis. Technicians can view the program description, get more information on dates and venues across India, and register online at:

http://icp.ishrae.in/Details/ICP-AC-Service-Level-1/3

3: **ACRESERVE:** This is a one-day seminar organised at chapter level by ISHRAE. The program is conducted at multiple chapters across India. It is meant for technicians

and practitioners in the RAC domain who want to update their knowledge with the latest trends in the service sector. The topics included range from safety, basics of trouble shooting to ducting and load distribution among others.

The Electronics Sector Skills Council of India (ESSCI)

ESSCI undertakes skill development programmes across segments and job functions in electronic system design and manufacturing. ESSCI is responsible for standardisation, accreditation and certification processes to enhance the employability of technicians. It has over 1,100 training partners and 4,013 training centers across the country. ESSCI has a qualification pack aligned to the AC servicing sector, which drive the creation of curriculum and assessments

The Ministry of Environment Forest and Climate Change (MoEFCC), and the Ministry of Skill Development and Entrepreneurship (MSDE) have signed a memorandum of understanding to jointly undertake upskilling and certification of 100,000 RAC service technicians. The training will cover good servicing practices and knowledge of alternative refrigerants to ozone-depleting chemicals. The project will be funded under the Skill India Mission - Pradhan Mantri Kaushal Vikas Yojana (PMKVY). ESSCI, and Ozone Cell under the MoEFCC are the implementing agencies for the project. The project is expected to be completed in the next sixteen months.

The three-day training programme is free of cost for technicians and provide the following benefits:

1. Upskilling on best practices with a focus on safe use of flammable refrigerants and reducing environmental impacts due to refrigerants.
2. Knowledge on better usage of R22, alternate refrigerants, Copper tubing operations, etc.
3. Bank Transfer to cover their expenses for three-day training
4. Technicians get a kit containing candidate handbook, mobile application, t-shirt, cap, note pad, and pen. The kit is worth Rs. 500.
5. Personal accidental insurance coverage of Rs. 2 lakh for three years
6. Technicians who clear the assessment receive a certificate.

Technicians can visit www.essc-india.org or contact +91 – 9971366057 for more information. In order to register for ESSCI trainings, a technician can visit the nearest training center. The details of training centers are available on ESSCI website.

Organisations, companies etc can contact ESSCI for organising upskilling programmes for their employees, National Skills Qualifications Framework (NSQF) certification of the existing employees, apprenticeship, model training centre etc. For more details, visit: www.essc-india.org or write to info@essc-india.org

INSTALLATION OF SPLIT AIR-CONDITIONERS: GOOD SERVICE PRACTICE GUIDE

Why should you follow this guide?

Proper installation of AC is very important. Incorrectly installation results in poor performance, increased electricity consumption regardless of star rating, and poor air circulation. Proper installation of ACs is one of the most important skills for an AC technicians. Furthermore, it is important to follow safety protocols during installation to ensure the safety of the technicians during the installation process.

Important things to remember:

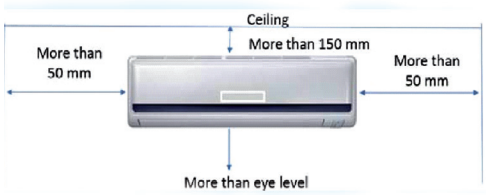
- Selection of location of indoor and outdoor unit are most important in ensuring proper installation.
- All safety steps like switching off main power supply, grounding the AC as per code, use of safety harness when installing outdoor unit should be followed by the technician.
- Use of appropriate tools and equipment is important, without which AC will not function properly. If you do not have the appropriate tool, do not proceed with installation.
- Follow the company manual for completion of installation, especially if refrigerant tubing is required to be extended.

Selection of Location for Indoor and Outdoor Units:

The evaporator in split ACs is located higher than window ACs, and on encountering this evaporator, the air gets cooled. This cold air goes through the supply grill to the space (room) with a certain throw and velocity. Considering cold air has higher density than warm air, it flows downward towards the floor. The warm air moves up as it is lighter than the rest of the air in the room. The following diagram explains the process:

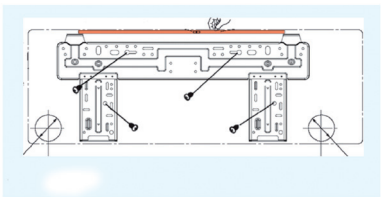
Things to remember when installing the indoor unit (IDU)

- The IDU must be mounted on a strong wall, away from direct heat and breeze.
- There should not be any obstruction to air circulation.
- Ensure adequate space, more than 150 mm (6”), around the IDU.
- The distance between the ceiling and the IDU should be more than 50 mm (2”) in case of front suction or grille design. In case of top suction or flat front panel design, this distance should be more than 150 mm (6”)
- For the drain, the tube should slope outside of the wall. The location should be away from flammable material and the tubing should have minimum bends and elbows.
- A hole should be drilled in the wall for the drain tube, refrigerant tubes, and electrical cable. The hole size should be decided to accommodate all these elements



Steps for installing the IDU

1. Align the installation plate on the wall horizontally, and mark locations for fasteners. Using the spirit level, mark the vertical centre line.



2. Drill 6 mm (0.23”) holes at the marked points, insert sheaths/ plugs and fit the installation plate with eight screws.
3. Open the cover of the hole of the plastic tube as per suitable direction for drainage.
4. Drill a hole of 70 & 100 mm (2.7” & 4”) diameter for 1.0 TR and 2.0 TR units respectively for tubing and wires.
5. The holes must be slightly sloping, 4 - 6 mm towards the outdoor side

6. Drill the tubing hole on the right or left side of the installation plate as per the drain line.
7. Use a special conduit for allowing the tubes to smoothly slide out.

Location for Outdoor Unit (ODU)

1. Choose a strong foundation that is away from direct heat and flammable material to install ODU.
2. There should be no obstruction to air circulation. The space around the ODU must be more than 150-250 mm (6"–9.8") in the back and over 1500 mm (59") in the front. If there is a shade above the ODU, it will improve its performance.
3. Avoid locating the ODU where it would be exposed to salty atmosphere, or direct sunshine.
4. The tubing should have minimum bends and elbows.

Steps to follow during ODU installation

1. Ensure that the base for installation of the ODU is rigid.
2. In case the site is located where the breeze is strong, or if it is at a high altitude, install the ODU lengthwise along the wall, using a shield to protect the fan. Select a site that ensures easy installation and future servicing.
3. If the drainage is bad, or if water is likely to accumulate near the ODU, place it on a concrete block or raised platform, if possible.
4. If the outdoor unit vibrates too much, adjust the angle of the installation legs. In case the unit is likely to tilt or fall, bolt it with 8 mm (0.31") diameter anchor bolts.

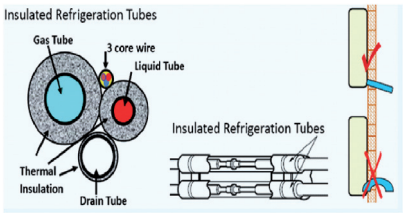
Split Air Conditioner Tubes

The technician must follow the following steps in installation of tubes:

1. Make a hole of 70 -100 mm (2.75" – 4") diameter in the wall (L or R) for taking out tubes, drain tube and wires.
2. Measure the distance between the IDU and ODU, including all bends.
3. Cut the tubes a little longer than the measured distance.
4. Remove burrs from the cut edges of the tubes.
5. Remove the flare nut from the tube end.
6. Flare the tube ends after inserting flaring nuts.
7. Tape the flaring portion to protect it from dust or damage.
8. Align the centres of both flares at both IDU and ODU. Tighten the flare nuts.
9. Insulate all tubes for better performance.
10. Connect the drain hose and extend it with a rigid tube, if required.
11. Insulate the drain hose laid indoors. The drain hose should be inclined downward.
12. Remove filters and pour water into the drain pan to confirm smooth flow of water

Connecting the Tubes

1. For connecting IDU & ODU with compressor, copper tubing is necessary.
2. When the distance between IDU and ODU is about 3 m, then the length of the tube should be 5 m and when it is 7 m, then the length should be 10 m. Connect the piping to the IDU.
3. Align the centres of both flares (IDU & piping) and tighten the flare nuts connecting the piping to the outdoor unit. Apply torque that is just right for flare nuts, over tightening shears the tubes, ultimately resulting in a leak.
4. Insulate all tubings for better performance. The drain pipe should be inclined. In case of the drain pipe placed like siphon, the condensate will not flow.
5. For air-conditioners with flammable refrigerants, it is advisable to avoid flare connections inside the room. If refrigerant tubings are to be connected indoors, cut the flare connections, swage the tube ends and join the tubes by brazing.



Tightening Torque Required for Different Size Flare Nuts

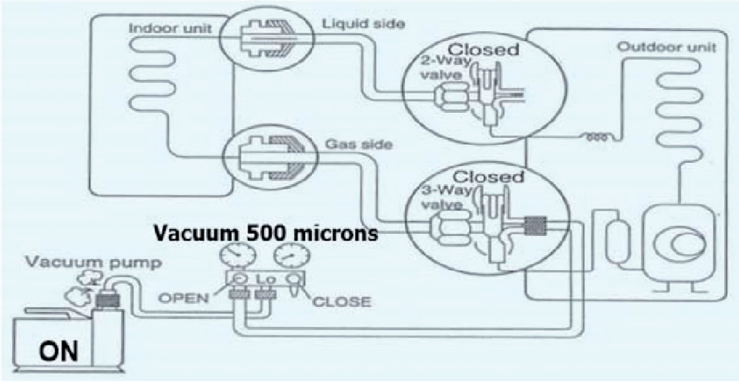
1. The torque required for tightening different tube sizes varies according to the diameter of the tube.
2. Apply torque that is just right for flare nuts, over tightening shears the tubes, ultimately resulting into the leak.
3. If a flare joint leaks even after tightening to the required torque, the reason for leakage may be due to bad flare, burrs on tube and wrong size flare. Then cut the tube and make the new flare.

Leak testing

For reliability and environment protection, the system must be pressure and leak tested, prior to refrigerant charging. Do not purge the system with refrigerant or use it for leak testing. This is due to flammability and global warming potential (GWP) concerns. The system should be checked for leakage using Oxygen Free Dry Nitrogen (OFDN).

Evacuation

1. The system should be free from air, moisture, and non-condensable gases to ensure proper and efficient operation of the air conditioner. Therefore, it is important to evacuate the IDU during installation of the air-conditioner and prior to refrigerant charging.
2. For deep vacuum, a suitable 2-stage rotary vane vacuum pump should be deployed (100-120 lpm. & blank-off 20 microns). Use micron gauge to measure evacuation pressure. The evacuation must reach 500 or lower-microns level. A bourdon type vacuum gauge cannot read vacuum in microns. Hence, actual vacuum reached cannot be known.



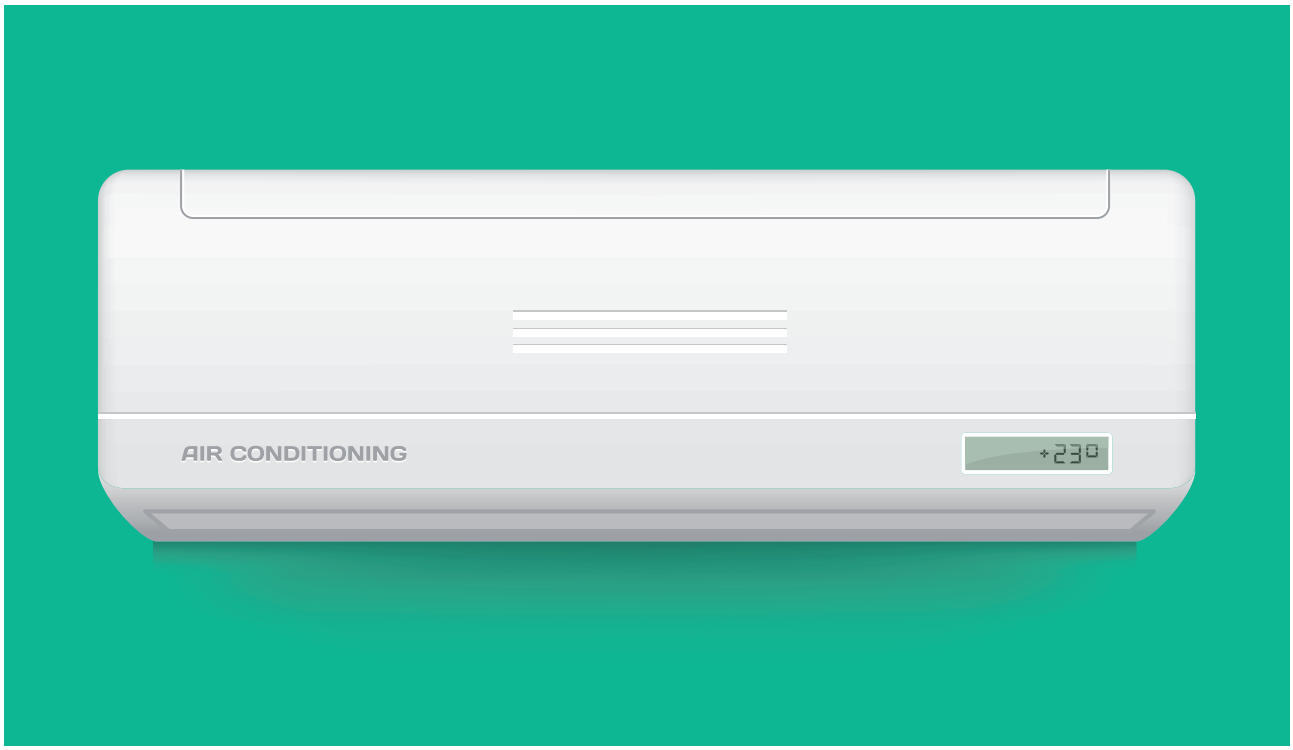
3. However, in the absence of a micron vacuum gauge, the vacuum pump should be run for at least about 15 minutes after the Bourdon type vacuum gauge reading shows 30" / 760 mm / 0 millibar (at sea level).

Additional Refrigerant Quantity for SAC

1. If the distance between IDU and ODU is more than what is suggested by the OEM, the quantity of refrigerant specified by the manufacturer may not be sufficient and additional refrigerant will have to be charged. Follow the installation manual to determine additional quantity and recharge as per the specifications only.
2. For air-conditioners with flammable refrigerants, the selection is made based on the room size and refrigerant charge quantity. Therefore, it is necessary to consult the manufacturer before extending the refrigerant tubes or charging additional refrigerant.

Post-Installation Check-up and Installation Report

1. After installation is complete, go through all the above-mentioned points to ensure you have followed the protocol. The technician must also fill the installation report which is a proof of good work, and a reference for later.
2. Inform the customer on proper maintenance of the air-conditioner including cleaning of filters, optimum temperature, etc.



'From the field' is a series of interviews with service technicians to help them share their experience with the fraternity. The series is aimed at promoting mutual learning and camaraderie among RAC technicians.

The third technician to be featured in the series is Mumbai-based Shafi Wakeel who works with service centres of AC manufacturing companies and takes on some freelance work in his free time. In an interaction with newsTRAC, Wakeel, 27, said that while the basics of repair and maintenance remain the same, new training programmes for technicians in the RAC domain is a good step for the evolving sector. Excerpts from the interview are shared below:

What is the nature of your job?

Ans: I work on a contract basis with service centres of three AC manufacturing companies. I also take up some repair, maintenance and servicing work as a freelancer, which is mostly garnered through word-of-mouth.

Are you happy with your work? How would you rate your happiness on a scale of one to ten?

Ans: I have been in this industry for the past seven years and it has been a very good experience. I think I will give it a seven out of 10 because this is a risky job and the work is seasonal in nature. For instance, during summer I get at least 10 calls per day for servicing, maintenance and installation. But in the monsoon which is an off season, we get exactly half the number of requests.

What can be done to ensure your safety on the job?

Ans: : Companies who hire AC technicians must look at providing them with safety shoes and belts which will keep them safe from the risk of electrocution. Also, while the work is more, manpower is less. They must look at having at least two technicians working together on machine at any given point in time

How would you rate your happiness with your customer's conduct?

Ans: Every customer is different. I would rate my experience at 6 out of 10. When it comes to an erratic or irritated customer I tend to practice the mantra of staying calm and not reacting to what they say. I believe that it's important to carefully listen to them.

Are you professionally trained?

Ans: Yes, I have completed a 6-month certificate course from the M.H. Saboo Siddik College of Engineering, Mumbai.

Do you feel your salary is adequate?

Ans: Yes, the commission I receive from the service centres is adequate at least for the 8 months of the year, when there is good amount of work.

Do you feel your technical skills are adequate? How willing are you to learn more skills in this field?

Ans: I do feel that my current skills are adequate. Besides the certificate course, I have learnt mostly through practical on-the-job training. While the basics of any machine whether a simple or invertor AC are the same, I am always willing to learn new things, especially when it comes to enhancing my job skills. Given that the RAC sector is evolving training programmes will be a good idea for us technicians. I specifically believe that there should be a course on Building Management System (BMS) which can equip us to work on Plant ACs that are fitted in large commercial spaces such as cinema halls and hospitals.

PRESSURE TEMPERATURE

Temperature		R-32		R-290 (Propane)		R-600a (Isobutane)	
C	F	kPag	psig	kPag	psig	kPag	psig
-40	-40	80	11.6	12	1.7	-71	-10.3
-38	-36	96	13.9	21	3.1	-68	-9.9
-36	-33	114	16.5	32	4.6	-65	-9.4
-34	-29	133	19.2	43	6.3	-61	-8.8
-32	-26	153	22.2	55	8.0	-56	-8.2
-30	-22	174	25.3	68	9.9	-52	-7.6
-28	-18	197	28.6	81	11.8	-48	-6.9
-26	-15	222	32.2	96	13.9	-43	-6.2
-24	-11	248	36.0	111	16.1	-38	-5.5
-22	-8	276	40.0	127	18.5	-32	-4.7
-20	-4	305	44.2	144	20.9	-26	-3.8
-18	0	336	48.8	162	23.6	-20	-2.9
-16	3	369	53.6	182	26.3	-13	-1.9
-14	7	404	58.6	202	29.3	-6	-0.9
-12	10	441	64.0	223	32.3	2	0.2
-10	14	480	69.7	245	35.6	10	1.4
-8	18	522	75.7	269	39.0	18	2.7
-6	21	565	82.0	293	42.5	28	4.0
-4	25	611	88.6	319	46.3	37	5.4
-2	28	659	95.6	346	50.2	48	6.9
0	32	710	103.0	375	54.3	58	8.5
C	F	kPag	psig	kPag	psig	kPag	psig
2	36	763	110.7	404	58.7	70	10.1
4	39	819	118.8	436	63.2	82	11.9
6	43	878	127.3	468	67.9	95	13.7
8	46	940	136.3	502	72.8	108	15.7
10	50	1004	145.6	538	78.0	122	17.7
12	54	1072	155.4	575	83.3	137	19.9
14	57	1142	165.7	613	88.9	153	22.2
16	61	1216	176.3	653	94.8	169	24.5
18	64	1293	187.5	695	100.8	186	27.0
20	68	1373	199.2	739	107.1	204	29.6
22	72	1457	211.3	784	113.7	223	32.4
24	75	1544	224.0	831	120.5	243	35.2
26	79	1635	237.2	879	127.5	264	38.2
28	82	1730	250.9	930	134.9	285	41.3
30	86	1829	265.2	982	142.5	308	44.6
32	90	1931	280.1	1036	150.3	331	48.0
34	93	2038	295.5	1093	158.5	355	51.6
36	97	2148	311.6	1151	166.9	381	55.3
38	100	2263	328.2	1211	175.6	407	59.1
40	104	2382	345.4	1273	184.7	435	63.1
42	108	2505	363.3	1337	194.0	464	67.3

PRESSURE TEMPERATURE

Temperature		R-32		R-290 (Propane)		R-600a (Isobutane)	
44	111	2633	381.9	1404	203.6	494	71.6
46	115	2765	401.0	1472	213.5	524	76.1
48	118	2902	420.9	1543	223.8	557	80.7
50	122	3044	441.4	1616	234.3	590	85.6
52	126	3190	462.7	1691	245.2	624	90.6
54	129	3341	484.6	1768	256.4	660	95.9
56	133	3498	507.3	1848	268.0	697	101.1
58	136	3659	530.7	1930	279.9	736	106.7
60	140	3826	554.9	2014	292.1	775	112.5

Temperature		R-22		R-410A	
C	F	kPag	psig	kPag	psig
2	36	431	62.5	755	109.5
4	39	466	67.6	810	117.5
6	43	502	72.9	868	125.9
8	46	541	78.4	929	134.7
10	50	580	84.2	992	143.9
12	54	622	90.2	1059	153.6
14	57	666	96.6	1128	163.7
16	61	711	103.1	1201	174.2
18	64	759	110.0	1277	185.2
20	68	808	117.2	1356	196.6
22	72	859	124.6	1438	208.5
24	75	913	132.4	1523	220.9
26	79	968	140.5	1612	233.8
28	82	1026	148.8	1705	247.3
30	86	1086	157.5	1801	261.2
32	90	1148	166.6	1901	275.7
34	93	1213	175.9	2004	290.7
36	97	1280	185.6	2112	306.3
38	100	1349	195.7	2223	322.4
40	104	1421	206.1	2338	339.1
42	108	1495	216.9	2457	356.4
44	111	1572	228.0	2581	374.3
46	115	1651	239.5	2709	392.8
48	118	1733	251.4	2840	412.0
50	122	1817	263.6	2977	431.8
52	126	1905	276.3	3118	452.2
54	129	1995	289.3	3263	473.2
56	133	2087	302.7	3413	495.0
58	136	2183	316.6	3567	517.4
60	140	2281	330.8	3726	540.4

PRESSURE TEMPERATURE

Temperature		R-22		R-410A	
C	F	kPag	psig	kPag	psig
-40	-40	5	0.8	75	10.9
-38	-36	15	2.3	91	13.2
-36	-33	26	3.8	109	15.8
-34	-29	38	5.5	128	18.5
-32	-26	51	7.3	148	21.4
-30	-22	64	9.3	169	24.5
-28	-18	78	11.4	192	27.9
-26	-15	94	13.6	216	31.4
-24	-11	110	15.9	242	35.2
-22	-8	127	18.4	270	39.2
-20	-4	145	21.1	299	43.4
-18	0	165	23.9	330	47.9
-16	3	186	26.9	363	52.7
-14	7	207	30.1	398	57.8
-12	10	231	33.4	435	63.1
-10	14	255	37.0	474	68.7
-8	18	281	40.7	515	74.7
-6	21	308	44.7	558	81.0
-4	25	336	48.8	604	87.6
-2	28	366	53.2	652	94.5
0	32	398	57.7	702	101.8

REFRIGERANT CHART

Refrigerant	Chemical name	Common names	Flammability	Ozone Depleting Potential	Global Warming Potential	Main Uses in Air-Conditioning & Refrigeration	Precautions for handling
R-22	Chlorodifluoromethane	Freon 22, Solkane, ISCEON	A1 – Not flammable or toxic	0.055	1810	Window AC, Split AC, Chillers, Packages AC, Water Coolers	Contact with skin can cause frost bite.
R-410A	Blend containing Hydrofluorocarbon	Suva410A/ Forane 410A/ Puron/ EcoFluorR410/ Genetron R410A/ Daikin R410A	A1 - Lower toxicity & no flammability	0	2088	Split AC, Packaged AC, VRF, Chillers	Contact with skin can cause frost bite. Inhalation of gas can cause suffocation.
R-32	Difluoromethane	Methylene fluoride	A2L – Lower toxicity & lower flammability	0	675	Split AC	Contact with skin can cause frost bite. Mildly flammable – no open flames or sparks in work area.
R-290	Propane		A3 -Lower toxicity & higher flammability	0	3	Split AC	Contact with skin can cause frost bite. Highly flammable – no open flames or sparks in work area.
R-600a	Isobutane		A3 -Lower toxicity & higher flammability	0	3	Domestic refrigerator	Contact with skin can cause frost bite. Highly flammable – no open flames or sparks in work area.

newsTRAC

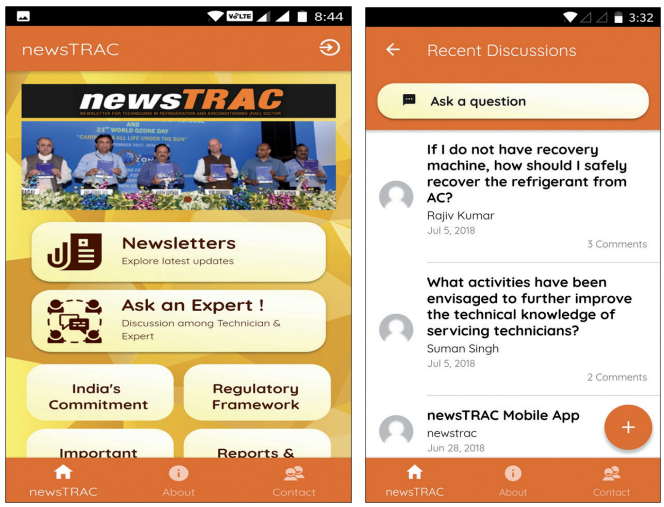
THE MOBILE APPLICATION FOR SERVICE TECHNICIANS

- As we move towards super-efficiency and new generation refrigerants, servicing sector needs become more pronounced
- Servicing sector professionals highlight lack of proper information on tools and tips for servicing new equipment and refrigerants as a major gap

newsTRAC – a mobile app intends to bridge this gap

- newsTRAC - a mobile based application will serve as a platform for the servicing agent in the field to ask a question directly to the team of experts either through a text based query or a picture.
- The query will be addressed within the stipulated period of time by our team of experts.

User Guide



Download from the Google Play **Search for 'newsTRAC' or Scan**

Ministry of Environment, Forest & Climate Change
Government of India

For further information
Ozone Cell, Ministry of Environment, Forest and Climate Change
Government of India
Core-4B, 2nd Floor, India Habitat Centre,
Lodhi Road, New Delhi-110 003
Tel: 011-24642176; Fax: 011-24642175
Email: pmucfc-mef@nic.in,
Website: www.ozonecell.com

THE ENERGY AND RESOURCES INSTITUTE
Creating Innovative Solutions for a Sustainable Future

For further information
Karan Mangotra
TERI, Darbari Seth Block, IHC
Lodhi Road, New Delhi-110 003
Tel: 011-24682100; **Fax:** 011-41504900
Email: karan.mangotra@teri.res.in
Website: www.teriin.org